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# GENITAL IRRITATION.

## By C. FAYETTE TAYLOR, M.D.,

OF NEW YORK.

LONG before Dr. Sayre called the attention of the profession to phimosis as an exciting cause, in some cases, of what has been termed "reflex paralysis," I had become satisfied, through a pretty extensive acquaintance with analogous phenomena, in an entirely different class of cases, that *imperfect sexual hygiene* was capable of producing many strange perturbations in both infantile and adult life; and among such disturbances a loss of muscular power was not infrequently one of the incidents. So that, while I expected that a too exuberant enthusiasm might carry some of the less stable professional minds off their balance, and that, in the reaction, some would go as much too far the other way, I felt that the profession was placed under obligations to Dr. Sayre for starting an inquiry which could not fail to result in increasing our practical knowledge of nervous phenomena. It is no doubt time that a voice was raised against a too indiscriminate application of one class of facts. But Dr. Newton M. Shaffer, in an article on "Indiscriminate Circumcision," in the May number of the ANNALS OF ANATOMY AND SURGERY, denies, by implication and argument, that there is such a thing as "reflex paralysis" resulting from genital irritation. Such extreme generalization, I feel confident, is incorrect. Because mistakes are made by persons with insufficient opportunities, or with habits of imperfect observation, it does not prove anything, except the necessity for greater caution, against a single established fact.

Because a case comes to me, every few weeks, with plaster of paris jacket, or some other form of spinal support, and examination establishes and time proves that there was a mistake in diagnosis, and that no disease of the spine existed, does that, or any number of like instances, prove that there is no such thing as spondylitis? While it is well to call attention to the danger of precipitancy in coming to conclusions, in cases presenting loss of power with phimosis or irritable clitoris, it is *not* well for the profession to underestimate or overlook the importance of a glans penis irritated by an adherent prepuce or compressed by a phimosis. I have seen cases where it was extremely difficult, to say the least, to make the differentiation between the symptoms of the earlier stages of hip disease and sclerosis, or whether some accidental muscular strain might not be the cause of the imperfect locomotion for which the patient was brought to me. Sometimes only after considerable time and repeated examinations can a conclusion be reached. One such case was especially perplexing, and all the more so because, though the prepuce adhered, there was not the least apparent *local* irritation; but, on detaching the prepuce from the glans, all the symptoms disappeared; and, though nearly a year has elapsed since the operation, no evidence of central lesion appears. Another case was that of a boy sixteen years old, but having the mind, body and appearance of a boy of eleven or twelve. There was no lameness, pains or disturbance of the muscular functions. The prepuce was firmly adherent to the glans, including the corona glandis, and could not be detached, but had to be dissected away. So soon as he recovered from the incidental soreness, there was an immediate increase of general bodily vigor, which included an acceleration of the rate of growth. A girl of thirteen was brought to me for bilateral talipes valgus; she was much under size, slow in intellection, with cold extremities and tremulousness in movements of the hands, and in voice also. Though lacking some of the more conclusive evidences, I gave a too hasty opinion of progressive paralysis, and refused to accept the case. The next day, after thinking the matter of my hasty decision over, I sent for the girl to be brought back for further examination. On examining the vulva, I found the mucous membrane of a dark red color, with abundant glairy secretion, large patches of cheesy material, a congested tumid clitoris; in short, a condition of the parts fairly equalling in effect an adherent prepuce or a compressed glans penis. I at once accepted the case, and treated the talipes for the opportunity that it would afford of determining how much the genital irritation had to do with the imperfect growth and nervous disturbance. The clitoris was not excised, but the parts were kept clean, and after some weeks there was a decided amelioration of their condition; and, with such amelioration, there was such a decided improvement in her general condition as to be observed by friends and strangers, and to leave no doubt in my own mind concerning the relation of the genital irritation to her special symptoms.[1]

The term "reflex paralysis" is too hypothetical for grave discussions, except it be used, like "spinal irritation," as a convenient cover for certain symptoms, without implying a definite explanation of their relation to a local cause. It is used, I suppose, to indicate loss of muscular power without other apparent cause than the genital irritation. If that be the case, I think no one—not disputing the facts as presented—can doubt that the phimosis in the following case was the cause of the loss of power. About a year ago, a respectable barber, living on the same block, brought his little boy to me for an injury to his elbow. He was then about two years old, and I observed that he was a bright and perfectly healthy child. I saw him several times in the street, the previous consultation causing me to notice the child more particularly. I saw him to-day, and he is as fine and healthy a child as one needs to see. There is not the least indication of any affection of the brain or spinal cord, as shown by any want of muscular power or of co-ordination, or any other effect of a central lesion. About Midsummer of last year, the child began to droop, and especially to walk with a peculiar and awkward gait. Dr. J. Henry Fruitnight was called, but he failed to make out the case, though he was inclined to the theory of disease of the vertebræ. Meanwhile, the child was growing worse, and had lost, by the end of July, all power of locomotion and, in fact, was completely prostrated, and not able to turn in bed or to lift his hands; but, during all, the appetite was good and bowels fairly regular, though he was greatly emaciated. At this juncture, Dr. Fruitnight, who had ceased to attend the child several weeks before, was recalled to the case, when he immediately removed a phimosis by circumcision, as related in his letter, which is given below. Within four days after the operation, the parents relate, the child began to raise his hands to his head, and to kick a couple of days after; in fact, after a couple of weeks, the only restriction to his movements was the soreness of his penis. He began to walk in about four weeks, and six weeks after the removal of the phimosis he was as well as ever he was, or as any child need be.[1]

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[1] Since the above was written, this case has returned with an amazing change for the better. The tremulousness has disappeared in hands and voice; she has grown at the rate of half an inch a month; she looks bright; walks with a more sprightly, easy gait; her mind is clear and active, and the last vestige of nymphitis has disappeared.

The "analogous phenomena" alluded to in the first sentence of this paper, I would state, by way of explanation, refer to a class of so-called "bed-ridden" cases, which it has been my lot to see very many of, and I seldom fail to discover, sooner or later, some form of *imperfect sexual hygiene* which can be definitely established as the exciting cause, or, at least, one of the exciting causes of the loss of muscular power, when loss of muscular power is the particular phenomenon presented in the case. Either there is masturbation, *mental* more often, and more difficult to control than manual; or sexual hunger to the extent of nocturnal or diurnal orgasms, either or both; or, what is more common and more difficult to get at, a self-sustained erotic condition, not amounting to erotic spasm, but occupying the entire nervous forces in the special emotion. These cases are especially apt to present loss of muscular power as the occasion for seeking professional aid, and not a few of those coming under my observation have been supposed to suffer from organic lesion of the spinal cord, and have been treated as such, while recovery by marriage or discipline has demonstrated the incorrectness of the hypothesis of central disease. The analogy between the loss of muscular power in a bed-ridden erotic female,[1] and the same from irritation of the glans penis or even the clitoris, with or without masturbation, is complete, and demonstrates, in my opinion, if any further proof were needed, that "genital irritation" *is* entirely capable of overwhelming the direct and co-ordinating functions of the nervous system, and of producing a more or less complete loss of power, or so-called "reflex paralysis," in a variety of ways.

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[1] 259 West Fifty-fourth Street, New York, May 8th, 1881.

*Dear Doctor:*

I first saw the boy in July of last year. His mother said that he had been losing the power over his limbs for a couple of months. When I saw him, he walked with a tottering gait, his abdomen thrown forward and head drawn back. He appeared as though he would fall at every step. Moreover, the boy was growing more and more emaciated daily. No positive diagnosis was made, but spinal disease was suspected, and the mother was advised to consult a specialist in that department. She accordingly visited a number of gentlemen, who made as many different diagnoses. One gentleman diagnosticated caries of the cervical vertebræ, another infantile paralysis, and another stated that he was unable to make a satisfactory diagnosis; and at one institution the symptoms were ascribed by the physician, to the presence of intestinal worms. The case was not treated by any of these gentlemen further than the exhibition of an anthelmintic by the last mentioned physician, and which was without effect.

In the following month the patient returned to me, when, in the course of my examination of him, I discovered that he had an elongated and adherent prepuce. It then occurred to my mind that the patient was suffering from reflex paralysis induced by genital irritation, caused by adherent prepuce. Circumcision was advised to the parents, who unhesitatingly consented thereto. The patient was brought under the influence of chloroform, and the operation was performed in the usual manner, the wound was not stitched, but was dressed by the open method, and in due course of time it healed by granulation. At once there was a marked improvement in his condition; the symptoms disappeared with great rapidity, and to-day he is as well as he ever was. His rapid recovery was a matter of surprise and of gratification to me. I must refer you to the parents for details during the interval of my non-attendance for several weeks previous to the operation.

Yours truly,
J. Henry Fruitnight, M. D.

To Dr. C. Fayette Taylor.

While the above is being written, a case comes under my notice which is so strikingly confirmatory of the position that genital irritation may cause loss of muscular power, that I give it in brief outline, reserving a fuller account for a future occasion. It is that of an unmarried lady, twenty-nine years old, who has been "delicate" during her entire adult life. Besides the usual assortment of pains and different kinds of feelings, loss of power in the upper extremities was the particular symptom for which my advice was sought, it having been attributed by her last physician to "spinal disease." The loss of power amounted to inability to dress herself at times, and to inability to use the arms in the ordinary way, for several years last past, and they were getting worse. But I found, within three days, that this lady had been in the habit of masturbation since she was thirteen or fourteen years old, with the exception of about four years, during which, she insists, there was no manual excitation. But it is to be remarked that there was little, if any, amelioration of her symptoms during this period of alleged exemption from physical excitation, the erotic mental state being kept up, according to her confession, which was sufficient to keep up the genital excitation. Nevertheless, I have already ascertained that the power over the upper extremities returns whenever the attention can be aroused and diverted to another direction from that usually occupying it, which precludes the possibility of a central lesion. Examination shows a highly congested condition of the genital organs, accompanied by leucorrhœa, hypertrophy, etc.

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[1] Those interested in the phenomena presented in bed-ridden women are referred to a forthcoming paper on this subject.

# THE PRESENT LEGAL STATUS OF THE STUDY OF HUMAN ANATOMY IN THE UNITED STATES.

By EDWARD MUSSEY HARTWELL, M. A.,

OF BALTIMORE, MD.,

FELLOW OF JOHNS HOPKINS UNIVERSITY.

THE Massachusetts Act of 1784 only authorized dissection of dead duelists as a mark of infamy; therefore, the New York Act of 1789 must be considered as the first American Anatomy Law. To summarize the legislation from 1789 to 1879, we may say that twenty-four States allow dissection; fifteen States have liberal Anatomy Acts, while nine have illiberal ones; the laws of fourteen States are silent regarding anatomy, excepting their laws on malpractice; twenty-eight States forbid the desecration of graves, while the laws of ten States are silent regarding it; the laws of six States are silent touching both dissection and disinterment; Dakota only of the eight Territories allows dissection; four Territories forbid exhumation, and four have no enactment regarding it; twelve States and one Territory require the burial of *cadavera dissecta.*

The District of Columbia occupies a unique position among the capitals of civilized States, in that the studies of its anatomists and the graves of its dead are alike unprotected by statutory enactments. The United States government sends Washington resurrectionists to jail when it can; but it has recently utilized in the examinations before the Naval Medical Examining Board, in the city of

Washington, as many as twelve subjects, which could be procured by stealth only.

The most elaborate, the most liberal, and also the most stringent of the American Anatomy Acts have been passed within the last five years. Those of Indiana, Ohio, and New York were passed in 1879. The amended Michigan Act of March 2, 1881, is, so far as the writer can learn, the latest and most liberal American Anatomy Act. The New York Act of June 3, 1879, may be instanced as a type of the liberal class of American Acts. It reads:

> "It shall be lawful in cities whose population exceeds 30,000 inhabitants, and in counties containing said cities, to deliver to the professors and teachers in medical colleges and schools in this State, and for said professors and teachers to receive, the remains or body of any deceased person for the purposes of medical and surgical study; provided, that said remains shall not have been regularly interred, and shall not have been desired for interment by any relative or friend of said deceased person within twenty-four hours after death; provided, also, that the remains of no person who may be known to have relatives or friends shall be so delivered or received without the consent of said relatives or friends; and provided that the remains of no one detained for debt, or as a witness, or on suspicion of crime, or of any traveller, nor of any person who shall have expressed a desire in his or her last sickness that his or her body may be interred, shall be delivered or received as aforesaid, but shall be buried in the usual manner; and provided, also, that in case the remains of any person so delivered or received shall be subsequently claimed by any surviving relative or friend, they shall be given up to said relative or friend for interment. And it shall be the duty of the said professors and teachers decently to bury in some public cemetery the remains of all bodies after they shall have answered the purposes of study aforesaid; and for any neglect or violation of this provision of this act the party so neglecting shall forfeit and pay a penalty of not less than $25 nor more than $50, to be sued for by the health officers of said cities, or of other places, for the benefit of their department."

An earlier law of New York forbids all traffic in subjects, or any use of them, except for anatomical purposes, under penalty of imprisonment in jail for not more than a year.

It would be interesting, did our limits permit it, to discuss explicitly the influences which have retarded, and in some cases arrested, the development of anatomical science in different parts of America, and to trace the feeling which underlies inadequate and repressive legislation, no less than mob violence, to its source in the popular prejudice against the dismemberment of dead bodies. We should find strange survivals in the United States of mediæval burial customs, and beliefs regarding the spirits of the disembodied which antedate Christianity. We can notice here, however, only two of the factors in the popular prejudice against dissection—namely, the belief in sorcery and the legal sanction of dissection as a mark of infamy.

In December, 1692, the province of Massachusetts Bay incorporated the major portion of the English Act of 1604 against witchcraft among its statutes. The history and provisions of this Act are worthy of more than passing mention, because it contains not only the first American, but also the first English, statutory prohibition of the desecration of graves, and indicates full well that the belief in sorcery was a potent factor in popular prejudice against human dissections. It contained the following provision, new to the English law: "If any person shall take up any dead man, woman, or child out of his, her, or their grave, or any other place where the dead body resteth, or the skin, bone, or any other part of any dead person, to be employed in any manner of witchcraft, inchantment, charm, or sorcery, whereby any person shall be killed, destroyed, wasted, consumed, pined, or lamed in his or her body, or any part thereof," every such offender "shall suffer pains of death as a felon, and shall lose the benefit of clergy and sanctuary."

This Act was cited formally in indictments drawn in

Maryland in 1674, and in Massachusetts in the Spring of 1692, and was acknowledged to be in full force in Pennsylvania in 1684. Massachusetts seems to have been the only colony to embody it in its laws. The Privy Council repealed the Act in 1695, because it was "not found to agree with ye Statute of King James the First whereby ye Dower is saved to ye Widow and ye Inheritance to ye heir of ye party convicted." The English Act remained unrepealed till 1736; and, so late as 1712, was declared to be in force in South Carolina, it is said. It does not appear that any "resurrectionist" was ever convicted under it in America.

The Church by denying burial in consecrated earth to the bodies of murderers and suicides, and the State by adding dissection to the death penalty in certain cases, have combined to render dissection a peculiar mark of infamy in the minds of the populace. According to Celsus, the Alexandrian Anatomists dissected "*nocentes homines, a regibus ex carcere acceptos.*" In Prague, as early as the founding of the University, in 1348, the executioners were ordered to deliver the dead bodies of malefactors to the medical school. In 1505, the town council of Edinburgh granted the Surgeons' Company "to have anis in the yeir ane condampnit man after he be deid to work anatomea of." It was enacted (32 Henry VIII, 1540), that the Mystery and Commonalty of Barbers and Surgeons of London might "take yearly forever four persons, condemned, adjudged, and put to death for felony, to make incision of the same dead bodies." In 1752, in order that "some further terror and peculiar mark of infamy might be added to the punishment of death," Parliament legalized the delivery of the bodies of executed murderers to the Surgeons for dissection. You will find pictured in the Newgate Calendar the way in which the bodies of criminals were exposed in the Hall of the Surgeons' Company during the process of dissection to the gaze of the curious. Pennsylvania passed no Anatomy

Act till 1867. Mr. Thompson Westcott, in his History of Philadelphia, says: "Late in November, 1762, Dr. Shippen received the first subject of which there is any record. A negro man having cut his throat with a glass bottle, from the effect of which he died; the action upon his case is thus recorded by the *Gazette* of December 2. After the coroner's jury had pronounced him guilty of self-murder, his body was immediately ordered, ***by authority***, to Dr. Shippen's Anatomical Theatre."

We have already noted the Massachusetts Law of 1784; the New York Act of 1789; the United States Law of 1790; and the New Jersey Law of 1796, regarding the dissection of certain dead criminals. The dissection of executed criminals, as such, is still lawful within the special jurisdiction of the United States Government and in the following States: Alabama, Arkansas, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Massachusetts, Missouri, Nebraska, and New Jersey. The select committee which reported to the Legislature the Massachusetts Act of 1831, recommended, but in vain, that the addition of dissection to the death penalty be abolished. France, in 1790, and England, in 1832, recognizing the impolicy of employing dissection as a mark of infamy, repealed the laws allowing the dissection of murderers.

All things considered, the attitude of the Italian cities of the fourteenth century, and of the Empire of Japan to-day, must be characterized as more liberal and enlightened regarding anatomy than that of the United States, and of very many of the individual States. I refrain from instituting a detailed comparison between European and American facilities for the study of anatomy; but it could readily be shown that one who should desire to become thoroughly expert in all branches of practical anatomy, would be justified in going from America to Germany or France, simply on grounds of economy. Excepting the Michigan Anatomy Act, which is not yet five months old, it may fairly be said that an Act which should embody the best features of the best American Anatomy Acts, while it would compare favorably with the British laws, would fall far short in point of comprehensiveness and liberality of the French laws of seventy years ago, not to speak of the French and German laws of to-day.

It is hardly too much to say that the anatomists of America owe as much to resurrectionists as they do to legislators for such laws as are at present protecting them. The New York Law of 1789 owed its existence to the Doctors' Mob of 1788. In our quotations from the autobiography of Dr. J. C. Warren, we have shown how the difficulty and danger of procuring subjects for dissection led to the passage of the Massachusetts Law of 1831. It is by no means improbable that the murders committed by Burke and Hare in Edinburgh in 1828, which led Parliament to pass the Warburton Anatomy Act in 1832, had some influence upon the Massachusetts legislators of fifty years ago. Indiana had not legalized dissection when, in May, 1878, the body of the Hon. J. Scott Harrison, a son of the late William Henry Harrison, President of the United States, having been stolen from its grave near the Ohio line, was, on the day after its burial, found by a son of the deceased in a Cincinnati dissecting room, whither he had gone in search of another body. This famous "Harrison horror" led to the improvement in 1879 of the laws of both Indiana and Ohio. Possibly the stringent amendment to the Iowa Law, passed March 26, 1880, and the amended Michigan Law of March 2, 1881, which is at once the latest and most liberal of American Anatomy Acts, may be traceable to the violation of the Harrison tomb.

The District of Columbia and the States of Delaware, Florida, *Kentucky, *Louisiana, *Maryland, Mississippi, Nevada, *North Carolina, Oregon, Rhode Island, *South

Carolina, Texas, *Virginia, and West Virginia are without Anatomy Acts. In the District of Columbia and the States whose names are starred in the above list, there are thirteen medical schools, aggregating 1,510 students. Maryland, which, like the District of Columbia, Delaware, Florida, Louisiana, Nevada, North Carolina, and South Carolina, has no statute forbidding grave robbery, is to-day, in order to punish body snatching, obliged to fall back on the common law of England; although the common law penalty was superseded nearly fifty years since by the passage of the Warburton Act. During the past Winter there were, I am told, five hundred and forty-five medical students in the city of Baltimore. In the year 1880 five hundred and seventy-seven unclaimed dead were buried at the expense of the city.

In view of what has been said, is it not pertinent to ask how much Burking and grave robbing is likely to be needed to induce the Congress of the United States and the Legislatures of Maryland and her sister States to legalize anatomy; and are they likely to model their belated Acts on the New York Law of 1789, or the Michigan Act of 1881? "It may be," as Governor Lincoln said in his address to the Massachusetts Legislature in 1830, "that this subject is of a nature too delicate for direct legislation. But the public mind should be instructed in its interesting importance. Let it be shown that the knowledge which is sought in the science of anatomy concerns all the living, and that without it the accidents and ills which art might remedy are beyond relief. Let the reason of men be addressed, and prejudice be dispelled, by information and the force of argument. It may then come to be understood that a community which demands the exercise of skill and denies the means to acquire it, which punishes ignorance and precludes the possibility of removing it, is scarcely more compassionate than that Egyptian harshness which imposed the impracticable task in cruel oppression of the inability to perform it."

# CERTAIN MOVEMENTS OF THE BLADDER, AND THEIR RELATION TO LITHOTRITY.

By REUBEN A. VANCE, M. D.,

OF CINCINNATI, OHIO.

THERE is one point connected with the manipulation of the lithotrite in the human bladder to which a proper amount of attention has not been given. I refer to the special motions of the vesical walls themselves, when stimulated by the presence of the lithotrite. Imagine a patient properly situated before a surgeon, and the latter engaged in introducing a lithotrite. The beak of the instrument has traversed the bulbous urethra, and its point has just effected an entrance into the membranous portion of the urinary canal. Here the *compressor urethræ* for a moment interrupts its journey. As soon as this muscle relaxes, the point of the beak enters the prostatic urethra, and another delay is experienced. At this point it is very necessary that the surgeon "hasten slowly." Permit the instrument to be influenced by not more than one-fourth its weight; very soon the obstruction seems to vanish, and the instrument is carried into the bladder by the action of the parts about the vesical neck. This is generally the case where the bladder is healthy, and the prostate body not hypertrophied. How is it when the vesical cavity is inflamed, or the prostate enlarged? In such cases the behavior of the parts undoubtedly depends upon the state of the sphincter of the bladder; if this is unusually powerful, the lithotrite will meet with great obstruction. In any event, the rule that should guide the surgeon is simple and plain: Carefully retain the point of the beak in the prostatic urethra, and wait for spontaneous subsidence of the obstruction it has encountered. If, at the end of a few moments, there is no sign of relaxation, force must be applied to the handle of the lithotrite, and the beak made to enter the bladder. Nothing but personal experience can teach the surgeon just how to behave in such an emergency. It is here that the great value of an experienced teacher is appreciated by every one striving to acquire this art. The beak well in the bladder, the manipulations take one of two well-defined directions; either the lithotritist follows Brodie and makes the calculus come to the instrument, or he is guided by the teaching of Civiale and makes the lithotrite find the stone.

Sooner or later, however, every man who labors much in this province of practical surgery, strikes out a path peculiar to himself, just as the personal experience of the lithotritist enables him to divide cases of vesical calculus into a number of different groups—the one for relief by the "Rapid Lithotrity with Evacuation," a method recently brought into deserved prominence by Bigelow, of Boston; the other by the "maximum of work and minimum of disturbance," plan of Civiale, in which treatment is prolonged over a length of time, and relief is afforded after numerous sittings, in each one of which but a trifling amount of work is accomplished; so does daily contact with diverse cases fit him for deciding upon the proper course to be pursued in order to seize and examine the stone in each individual instance. The procedure I adopt and teach is as follows: The beak of the lithotrite safely through the vesical sphincter and within the cavity of the bladder, the blades are not to be opened until the stone is touched or the posterior wall of the bladder reached. Consequently, after the beak is passed through the sphincter of the bladder, it is to be continued directly onwards. If the stone is touched, the beak is directed slightly to the opposite side by revolving the handle properly, and the blades are separated. The posterior surface of the female blade is made to touch the lining membrane of the posterior wall of the bladder, the anterior surface of the male blade in like manner being brought in contact with the lining membrane of the anterior wall. If, at this moment, the handle be slightly revolved, so that the separated blades are made to pass and repass over the segment (of 90°) of a circle, the contractile walls will be stimulated and the blades firmly grasped. The surgeon holding the handle is conscious of the firm pressure made on the blades of the lithotrite—a pressure which tends to close the open blades. Immediately succeeding the effort to close the blades of the lithotrite comes an apparent relaxation of the antero-posterior contraction, and at the same moment the surgeon is made conscious of the fact that the stone has been elevated and carried to the centre of the bladder. If the blades of the lithotrite are now forced together, the stone is grasped between them. To recapitulate: When the beak of the lithotrite is passed through the vesical sphincter, it is to be carried onwards—the blades vertical—until the stone is touched or the posterior wall of the bladder reached. If the stone is touched, the handle is revolved so that the blades pass the calculus and the journey of the beak resumed. When the beak reaches the posterior wall, the wheel of the handle is withdrawn, so that the anterior surface of the male blade is brought in contact with the mucous membrane lining the anterior wall of the bladder. Both blades point directly upwards. The surgeon now gently revolves the handle to and fro, so that the blades are brought in contact with both walls of the bladder, and stimulates that organ to contraction, being careful to leave the blades at the close in a vertical position. At first there is what seems like an antero-posterior contraction;—the blades are forced towards each other. This tendency to close the blades being resisted, there quickly succeeds a different series of movements—the base of the bladder seems to rise, and the stone is elevated and rolled forward; if the blades are now closed, in very many instances, the stone is caught by its center, thus showing that, as a consequence of this secondary movement, the stone has been carried to the middle of the bladder. Such in brief are the movements to which I desire to direct attention. As a consequence of the stimulus communicated by the revolving blades of the lithotrite to the mucous lining of the bladder, the vesical cavity is diminished first in the antero-posterior diameter, and next in the vertical diameter. It is probable that during the first movement there is an increase in its vertical measurement, and during the second movement of its antero-posterior diameter. Be that as it may, it is an unquestionable fact that, when this series of movements is excited in the way directed, the contractions of the lower part of the bladder are sufficiently powerful and extensive to lift the stone and roll it into such position that the blades closed, while in a vertical direction, grasp it in the situation most favorable for crushing.

# ADDITIONAL FACTORS CONCERNED IN FRACTURES OF THE HUMERUS IN THE VICINITY OF THE ELBOW-JOINT.

By A. H. P. LEUF, M. D.,

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THE principal object of this paper will be to bring out prominently an important function that is subserved by the supinator longus and extensor carpi radialis longior muscles in fractures of the humerus in the vicinity of the elbow-joint.

That portion of the origin of the supinator longus which is nearest to the external condyle is fully 2.5 centimetres above it. Recent personal observation of 11 elbow-joints, in the dissecting room of the Long Island College Hospital, confirms this statement. In one very muscular subject the uppermost fibres of origin of the supinator longus, on both arms, passed as high up as the insertion of the deltoid, blending with the upper end of the brachialis anticus. The extensor carpi radialis longior also does not arise from the external condyle, but takes its origin from the lower third of the osseous ridge running up from the external condyle—the external condyloid ridge. The supinator longus comes from the upper two-thirds of this ridge, so that the extensor carpi radialis is between the supinator longus and the external condyle; this carpal extensor, in its course downward, lies beneath the supinator longus.

One function of the supinator longus is to rotate outward the radius after it has been rotated inward—*i. e.*, supinate after pronation. Another feature, which is more marked, is its action as a flexor. It is an invariable rule for muscles to act on every joint they pass over. The supinator longus, passing over the elbow and radio ulnar joints, must therefore act on both. It is evident, also, that the action of a muscle on a joint depends upon its relations to that joint. If these rules be valid, it follows that as this supinator longus passes along the antero-lateral aspect of these two joints, it will act as a flexor of the forearm upon the arm—will act on the radio-ulnar joints—producing supination—*half way*—and pronation—*half way*—when its proper relations to these joints for the performance of these functions are brought about by full pronation for the accomplishment of the former, and full supination for the latter; and lastly, it has a strong tendency to perform lateral abduction of the forearm—*i. e.*, to increase the ulnar deflection, and consequently the "carrying function" of Dr. Geo. R. Fowler.[1] The actions of the extensor carpi radialis longior are essentially the same as those of the supinator longus, but less in degree. This muscle crosses the wrist-joint posteriorly, in addition to passing the same joints that are in relation with the long supinator; consequently, in addition to its actions, in common with its supinator fellow, it extends the wrist. The performance of lateral abduction of the forearm by these two muscles is principally prevented by the structures at the inner side of the elbow-joint—*i. e.*, pronator teres, aponeurosis of common origin of the flexors, and the internal lateral ligament, aided by the brachialis anticus, triceps, and slightly by the biceps, in antagonizing the two abductors. But the two abductors are assisted by the structures at the outer side of the elbow-joint—*i. e.*, supinator brevis, anconeus, and the extensors.

Another muscle, the pronator teres, should be individually considered here. Its bony origins are from the internal condyle and from the inner side of the coronoid process of the ulna by a small muscular slip; from these two joints its fibres pass down and out to the middle of the outer side of the radius, where it is inserted.

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[1] I have, since writing the above, seen Prof. Jarvis S. Wight demonstrate before the class at the Long Island College Hospital, on December 18, 1880, the supinator and pronator actions of these muscles as stated above.

Dr. Lewis S. Pilcher (ANNALS OF THE ANATOMICAL AND SURGICAL SOCIETY, vol. ii., p. 368), referring to pronation and slight flexion as a method of treatment in fracture of the humeral condyles, says: "In this position sufficient flexion is accomplished to relieve tension of the flexor muscles, and yet not enough to excite the great triceps extensor to action, while the pronation relaxes the powerful pronator teres."

The doctor here makes a point in treatment which seems to me to be but partially the best in only one instance—fracture of the external condyle—as will be seen later on. When the pronator teres contracts in the unfractured arm, according to the above two rules, the middle of the radius moves forward and inward—the hand in pronation—and tends to produce flexion of the forearm on the arm. When the internal condyle, however, or the coronoid process, or both, are fractured, the contraction of this same muscle draws the internal condyle, or coronoid process, or both, as the case may be, downward and outward.

Let us consider the different groups of muscles influencing the position of the parts in a fracture of the external condyle, the capitellum and external epicondyle being separated from the shaft of the bone. The extensor group of muscles attached to the external condyle consists of the extensor carpi radialis brevior, extensor communis digitorum, extensor minimi digiti, and extensor carpi ulnaris. These tend to drag the external condyle down, but really do not do so, simply turning it out in the cup-shaped cavity of the head of the radius, which prevents downward displacement. The anconeus tends to rotate the external condyle backward and inward toward the olecranon, and also downward. The supinator brevis would draw it downward and forward, thus partly antagonizing the anconeus. The fibres of these two muscles, however, cross each other at almost right angles, so that together they tend, like the extensors, to rotate the external condyle outward.

The pronator teres, in addition to what has already been mentioned as regards its function, would tend to adduct the forearm. The flexors arising from the internal condyle would tend to do likewise, besides their ordinary actions.

As to treatment, the most rational way to meet these indications is as follows: Make full extension at the elbow and digital articulations, and keep the hand on a line with the forearm. This relaxes the triceps, anconeus, and the extensors attached to the external condyle. Putting the forearm in a position midway between pronation and supination would relax the supinator brevis and pronator teres, thus lessening the tendency of the latter to separation of the outer articular surfaces of the elbow-joint by adduction of the forearm. If complete pronation be induced, the supinator brevis will be made tense and tend to draw the external condyle downward and forward.

There being extension at the elbow, wrist and digital articulations, the flexors from the internal condyle would tend to act like the pronator teres—*i. e.*, adduct the forearm. But they are not a match for the two abductors, which could easily overcome the pronator teres, in case it did contract, because the leverage is so much the greater. They are equally an overmatch for the flexors. If any one doubts the ability of the abductors to overcome the pronator and flexors, let him remember that in this injury but two muscles are irritated, and they are the two abductors. The power of the pronator and flexors being so much greater, the energy of the abductors gives to them a power still greater. One is comparatively passive, the other vigorously active. The extensors, of course, also aid the abductors.

At first sight it would seem that the biceps would draw the upper end of the radius forwards, but this is not so. When the forearm is extended, the very effort of this muscle to bring the upper end of the radius forwards is the safeguard in preventing it; as is the contraction of the abdominal muscles the safeguard against an occurrence of hernia.

The triceps and brachialis anticus have no effect whatever on a fractured external condyle, directly or indirectly, so long as the forearm is fully extended. This is evident from the conformation of the trochlear surface of the internal condyle, and of the greater sigmoid notch. Besides this, the extension relaxes the triceps.

Now consider a fracture of the internal condyle—*i. e.*, when the trochlea and internal epicondyle are separated from the shaft of the humerus, and the muscles influencing its position. The muscles attached to this condyle are the flexor carpi radialis, palmaris longus, flexor carpi ulnaris, flexor sublimis digitorum, and pronator teres. They tend to draw the internal condyle downward and outward. This tendency would cause simply a rotation forward, downward and inward. The muscle acting most directly and most powerfully to produce the downward and forward displacement is the pronator, while the flexors are strongest in the effort at a displacement downward and inward. The anconeus and supinator brevis having their fibres running downward, but in opposite directions, the resulting course that the external condyle would tend to take would be down and out. But this is sound, and a fixed point, so that they would tend to draw the forearm up and out—*i. e.*, assist the abductors.

It seems to me that the treatment would be now to extend all the joints from the elbow down, and to completely supinate, so as to make tense all the muscles attached to the internal condyle—*i. e.*, pronator teres and flexors—thus causing them to keep the fragment down far enough to preserve a good ulnar deflection and "carrying function." But their action would be antagonized, to a certain extent, by the brachialis anticus, which would tend to bring the internal condyle up. The triceps is relaxed in consequence of full extension at the elbow. Were, however, the brachialis anticus to push up the internal condyle by means of its action on the ulna, it would necessarily bring about a separation of the articular surfaces of the head of the radius and external condyle. This the biceps would most effectually prevent. The two abductors and the extensors from the external condyle would also have a great deal to do in preventing a separation of the outer articular surfaces of the elbow-joint. Surely no one can doubt the ability of this array of power to overcome the comparatively small brachialis anticus.

The abductive power being so much greater than the adductive power, it may seem that a super-abduction would take place. Were all the muscles here involved equally irritated, then this would be the case. But the brachialis anticus is the only one directly irritated by the fragment, and consequently it is vigorously active in its attempts to force the troublesome condyle out of the way. As before stated, the antagonizing muscles, so much stronger and not directly irritated, oppose this action.

If, in a fracture of both condyles, the condition is treated in a similar manner to fracture of the internal condyle, the resulting degree of ulnar deflection and consequent preservation of the "carrying function" would depend on four muscles—*i. e.*, brachialis anticus, biceps, and the two abductors—and the normal ulnar deflection would be preserved. But there would result, in addition, a shortening of the injured arm by pulling the forearm up between the two condyles, forcing them apart, and thus producing a broader elbow-joint than normal.

The way to obviate this is to make continuous extension and counter-extension. This may be done in the same manner as in the lower extremities—*i. e.*, by means of the weight and pulley. Then pass a bandage around the lower end of the arm and adduct it. The weight could be so adjusted as to abduct the forearm sufficiently to preserve a good "carrying function." If no ulnar deflection of that arm existed previous to the injury, as Dr. Pilcher's table on page 367 shows in one instance, the surgeon could present his patient with the very best "carrying function," by simply making an ulnar deflection of the proper angle.

Epiphyseal separations may be treated as a fracture of one or both condyles; depending on the kind of separation.

Dr. Geo. R. Fowler, on page 364, says: "In looking over my tables, I find that those cases having the least amount of deformity were those that were the least treated." This is hinted at, and even directly mentioned, by the other three gentlemen, but neither gives a reason for it. It is evident, from what has been said, that the indications for treatment are better fulfilled when the arm is extended on a pillow than when it is flexed at right angles midway between pronation and supination, and in a splint, etc. Dr. Fowler also mentions two cases, on page 360, which emphasize this point. I would refer you to these cases, and also to the doctor's own criticism of them, on pages 364–5.

I would emphatically state that in proportion as the forearm is flexed on the arm, the supinator longus and extensor carpi radialis longior perform their abductor function less perfectly and their flexor function better. As flexion takes place, these two muscles, especially the former, have the joint receding from them, and their anterior relations to that joint becomes more pronounced, while their external relation to that joint become less distinct. Hence, in fracture of the lower end of the humerus in the vicinity of the elbow-joint, make full extension and no flexion.

In speaking of passive motion, Dr. Pilcher, on page 370, says: "There are two kinds of articular immobility between which there is a capital distinction. One is produced by periarticular muscular contraction, an *active* immobility, which favors and even excites articular diseases; the other is passive, is secured by the apparatus of the surgeon, and is powerful against the disorders which the first provokes."

Just here I would quote from Hilton.[1] Speaking on the subject of arthritis, he makes the following statement in italics: "*The same trunks of nerves whose branches supply the groups of muscles moving a joint, furnish also a distribution of nerves to the skin over the insertion of the same muscles; and—what at this moment more especially merits our attention—the interior of the joint receives its nerves from the same source.*" Is this not suggestive? Put your patient in bed and extend his arm on a pillow.[2] Enjoin him to keep his limb perfectly quiet; not to voluntarily move it.

In a fracture of the external condyle place the patient's arm midway between pronation and supination, so as to relax the pronator teres without making tense the supinator brevis. As the limb is kept at rest, the muscles surrounding the joint will act as a splint, better than a surgeon's, in coaptating the broken condyle to the shaft of the humerus. All the environments of the joint will then be synergistic to nature's efforts at repair.

Concerning passive motion, the great therapeutic value of rest in all reparative processes should be constantly borne in mind. The reasoning of Pilcher and Hilton in favor of rest are indisputable, and the facts of Hilton and Allis still more so.

If fear is entertained of anchylosis from allowing a fractured joint to rest continuously for from four to six weeks, keep it immobilized for two or three—for two weeks at least. Remember, also, a patient with an unconfined arm will not keep his limb strictly immobile for one day, much less so then for several weeks.

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[1] Hilton on Rest and Pain.

[2] In many cases the application of a well-fitting straight posterior splint may very well replace rest in bed.

To sum up the practical conclusions to be drawn from the above observations: In fractures involving the elbow-ioint place the patient's arm on a pillow fully extended and midway between pronation and supination, if the external condyle is the one fractured; if it is the internal condyle, then complete supination of the forearm in addition to full extension—avoiding carpal hyper-extension—should be made. If both are involved, the treatment should be the same as if it were a fracture of only the internal condyle, with extension added. Do not begin passive motion until the danger of moving the fragment is over; previous to this the patient will move the arm sufficiently to prevent much articular rigidity. As time goes by and pain lessens, the good effects of rest accumulate, and the patient will move his joint freely. By keeping the parts at rest the amount of callus will be less; consequently there will be less danger of implication of the musculo-spiral nerve—or its branches—or the ulnar, as they pass, the first in front, the second behind, the elbow-joint.

# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

## XIV.—HEROPHILUS AND ERASISTRATUS.

### THE MEDICAL SCHOOL OF ALEXANDRIA.

B. C. 320—250.

THE city of Alexandria, the new capital of Egypt, the new centre of learning and of future scientific investigation, the new rival of Athens and Pergamos, had already, in the third century antecedent to the Christian era, reached a degree of magnificent development, not merely in its immense population of a quarter of a million of Egyptians, Greeks, and Jews; not merely in its vast commercial and mercantile interests, nor in the grandeur of its public edifices—the Temples of Pan, and Neptune—the Soma, or Mausoleum of the Greek kings—the Emporium, or Exchange—the Serapium, or Temple of Serapis; and the

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splendid Museum, also known as the College of Philosophy —but in the loftier aim of a great centre of learning, a focus of intellectual illumination. Here were concentrated the great thinkers and workers of that brilliant age. The most famous living philosophers and renowned men of erudition known to the world were induced hither by every encouragement and liberal patronage. Here also was being accumulated all the literary treasures that zealous effort and lavish expenditure could possibly procure.

Soter, who was the brother of Alexander the Great, and the first of the Ptolemies, or Greek kings of Egypt, was a man of learning and of a most enlightened understanding and cultivated taste. He was the author of a history of Alexandria and a biography of its distinguished founder. Ptolemy Philadelphus, the son and successor of Soter, was a man of the same stamp, and inspired with the same zeal and enthusiasm to increase the glory of this grand city and the renown of the Alexandrian school.

It was under the direction of these celebrated rulers that the vast bibliographic treasures of the world were collected together in two royal libraries. It should be borne in mind that in that day books were scarce, very expensive, and difficult to obtain. They were preserved in families with religious care, a single volume or roll being regarded as the most precious heritage of a family. But for this care all the sacred and profane classics of antiquity would have perished many centuries ago.

It is said that one of the Ptolemies gave the Athenians no less than fifteen talents (more than fifteen thousand dollars), along with a beautifully executed transcript of the works of Æschylus, Euripides, and Sophocles, in exchange for the originals, which he retained for his own library. Thus it appears that no care, effort or expense was spared in the formation of these royal libraries, and such was the success of the enterprise under this munificent patronage that the Alexandrian libraries came in time to possess the enormous number of seven hundred thousand rolls or volumes. Writers differ as to the comparative size or contents of the ancient rolls or books with our modern average volumes. Some say that six hundred thousand Alexandrian rolls represented about two hundred thousand of ours; others, one hundred and twenty, and still others, only ninety thousand volumes. In either case, this famous library must have been immense.

The entire Alexandrian library was not massed at a single centre. The Bruchion collection was either near, or in the great structure used for the School of Philosophy—the Museum—and contained four hundred thousand rolls, which was the full extent of its capacity, and hence a second or supplementary, or, as it was called, the daughter library, was formed, and found lodgment in the Temple of Serapis, which stood quite remote from the Museum and near the centre of the city. The number of rolls in the Serapium was three hundred thousand. It was this great library that was accidentally destroyed when Julius Cæsar set fire to his own fleet in the harbor of Alexandria, the flames extending to the Museum, which stood in the immediate vicinity of the docks. The Museum, however, was soon after rebuilt by Cleopatra, the beautiful queen, who, with all her frailties and crimes, possessed an ardent zeal in the promotion of literature and the sciences. She made every effort to repair this grievous loss, and succeeded in inducing her admirer, Mark Antony, to present and transport to Alexandria the magnificent library of Pergamus, the hitherto boasted rival treasure of that city. This enormous acquisition was deposited with the rolls already in the Serapium, and Alexandria again prided herself in the possession of the largest library in the whole world. Before ending this rather lengthy account of these ancient libraries, I will briefly refer to the strong rivalry which existed between the bibliophiles of Alexandria and Pergamus. The library of the latter city could boast of but two hundred thousand volumes, and yet its increase was looked upon by Ptolemy Soter with so much jealousy that he forbade the exportation of papyrus from Egypt, whereby he hoped to prevent his Syrian rival from making paper to be used in copying manuscripts. This mean policy, however, resulted in the invention of parchment, or, as it was called, the paper of Pergamus, which subsequently quite displaced the bark of the papyrus, and served the after ages until modern paper was invented. To this day our vellum-bound antiquarian books are referred to, in European catalogues, as being bound in Perg.—a contraction of Pergamus—thus affording an interesting association with ancient times.

Let us now return to the Museum, or School of Philosophy, as it was in the palmy days of the first Ptolemies. Here we find the great masters and scholars dwelling together in social and friendly intercourse, fed and salaried at the public cost, almost a part of the royal family. Free from the common cares of the world, they devoted themselves to the study and development of every department of learning. Methinks I see the royal patron sitting in the midst of the philosophers, physicians and metaphysicans—Euclid, Aristophanes and Cronus; Theocritus, Hegesias and Timosthenes; as well as the three great members of the medical faculty, Cleombrotus, of Cos; Herophilus and Erasistratus. What a company of immortals! Their works and memories are fresh and radiant to-day, and will continue to shed lustre far into the remote ages of the future. "Thus the torch of civilization, which had anciently shone upon the banks of the Nile with a mysterious and isolated light, returned, after being increased and vivified at the free fires of the genius of Greece, to shed an éclat more resplendent than ever on its early cradle; and thus the city of the Ptolemies became not only the *entrepôt* of Greek and Roman commerce, but also a scientific focus, whose light was shed for ten centuries upon the antique universe." (*Renouard's Hist. of Med., Am. Ed.*, p. 169.)

None of the sciences received more encouragement than that of medicine. Hither students flocked from every region. For centuries the medical school of Alexandria was renowned among the nations for its superior advantages. So late as the middle of the second century after Christ, Galen wrote that the reputation of any physician was established when it was known that he had studied the healing art in that city; and even to have resided there for a short time, to have attended what might be called a post-graduate course of lectures at this Græco-Egyptian Medical Institute, gave an éclat to the physician of that day, far exceeding that which the American student now obtains by a tour of the medical schools of Europe.

While the collection of rare plants and animals which were brought to the national Museum from every known region of the earth, regardless of cost or care, gave a great impulse to the study of natural history as well as to materia medica, it was doubtless the liberal and extraordinary opportunity which this city alone afforded of dissecting the human body which made it attractive to home and foreign students of medicine. The study of practical human anatomy must have greatly improved physiological knowledge as well as given an impetus and precision to the advancement of surgical science and art.

The relaxation of the popular prejudice in allowing the examination of the bodies of the dead, and the authorization accorded by the royal founders of that school for the dissection of human corpses, were the events that secured the success and renown of the Alexandrian, completely eclipsed the ancient schools of Cnidos, Cos and Pergamus; imparted glory to the epoch, and laid subsequent ages under a lasting debt of gratitude.

Among the founders of the medical school of Alexandria the most distinguished personages were Herophilus and Erasistratus. They cultivated anatomy, physiology, medicine and surgery with ardor and success. It is a matter profoundly to be lamented that the written results of their labors have passed into oblivion with the exception of a few scattering fragments, which have been preserved in the works of Galen, Aretæus, Cœlius Aurelianus, Celsus, Dioscorides, Pliny, and some others.

Before giving particular sketches of these two anatomists, I will mention a few facts to show what was previously known concerning the structure of the human body. The first systematic dissections seem to have been made by the Pythagorean philosopher Alcmæon, who flourished in the sixth century before Christ. It is, however, uncertain whether he merely dissected the brute animals or ever ventured to use his scalpel on the human cadaver. We have reason to believe that the Eustachian tube was first observed by him, for Aristotle says that Alcmæon was wrong in affirming that goats breathe through their ears, a fact which the latter had observed to be possible. The cochlea of the ear, and the amnios of the fœtus, owe their names to Empedocles of Agrigentum, who probably first described them in the fifth century B. C. The true nerves were probably first distinguished from the tendons by Aristotle, who also recognized the brain of man to be larger than that of any other animal. Aristotle was the most celebrated zoötomist of antiquity, and well deserves to be called the father of comparative anatomy. He restricted the term *aorta* to the great trunk of the arterial system. The modern term *rectum* is the literal translation of his description of the straight progress of the bowel to the anus. He gave the name *diaphragm* to the abdomino-thoracic septum. Praxagoras, the tutor of Herophilus, is said to have been the earliest author who pointed out a distinction between arteries and veins. Owing to the confusion in the use of terms, it is difficult to understand the precise amount of anatomical knowledge which the ancients possessed previously to the advent of the two celebrities who are the subjects of this sketch. It must be admitted that the anatomy and physiology of that remote age was not only crude and erroneous, but fanciful and imaginary.

Herophilus appears to have been born at Chalcedon, in Bithynia, in Asia Minor; the year of his birth as well as that of his death is not now known, but we know that he lived in the time of Ptolemy Soter, B. C. 323–283. He was one of the pupils of Praxagoras, of Cos, who was the last of the family of the Asclepiadæ. He settled in Alexandria, where he acquired a famous reputation, and was one of the first founders of the medical school of that city, which, as above stated, became the most celebrated then in existence, and it continued to sustain this preëminence for a period of over five hundred years. He appears to have devoted himself chiefly to the pursuit of practical anatomy, not merely to the dissection of the lower animals, but quite extensively to that of the human body, as we are expressly informed by Galen. Great difference of opinion exists as to the probable truthfulness of the statement of Celsus, that both Herophilus and Erasistratus not only dissected human cadavers, but also the bodies of living men. Celsus records this as a fact, and without the least suspicion as to its truth. Tertullian, a native of Carthage, and one of the most learned fathers of the early Christian Church, who flourished about five hundred years after Herophilus, must have fallen into an error when he stated that Herophilus had vivisected hundreds of human beings, and he must also have had but little confidence even in post-mortem examinations. His exact words are: "Herophilus, that physician, or rather butcher, who dissected six hundred men, in order to find out nature; who hated man, in order to learn the structure of his frame; could not, by these means, come to a more perfect knowledge of his internal structure, since death produces a great change in all the parts, so as to render their appearance after death different from what it was before; especially, since they did not die a natural death, but expired amidst all the agonies to which the curiosity of the anatomist was pleased to subject them." It ought to be borne in mind that human vivisection would not be nearly so revolting to the feelings of men over two thousand years ago, when the lives of criminals and prisoners of war were so little prized, as it would be in modern times.

The following is the exact account of human vivisection given by Celsus in the preface of Lib. I., as translated by Alex. Lee (Celsus, De Medicina, 8°, London, 1831, vol. 1, pp. 8–9):

"The plan adopted by Herophilus and Erasistratus was much approved of, who obtained by royal edict criminals out of prison for dissection, alive, and contemplated, even while they breathed, those parts which nature had before concealed, with their relative position, colour, figure, magnitude, arrangement, hardness, softness, smoothness, and connection; also the processes and recesses of each, whether any one part is inserted into another, or whether it receives part of another into itself. For when there happens to be some internal pain, he cannot know what suffers, if he be ignorant of the situation of each viscus and intestine; nor can the part which is diseased be cured by him who is ignorant of what part it is; and should the viscera of any person be laid open by a wound, he who is ignorant of the colour of each healthy structure, cannot know what is sound, what is morbid; therefore, can render no assistance in the disease: and they maintain that external remedies are more properly applied, when the situation, structure, and magnitude, of the interior parts are ascertained; and the same argument is applicable in all those cases already mentioned. Neither should it be deemed so cruel, as many exclaim, to search for remedies for an innocent people of succeeding ages, at the expense of only a few capital culprits."

Thus it is seen that Celsus speaks approvingly of this most atrocious practice.

Herophilus was an original investigator. His researches and discoveries were chiefly anatomical, his writings on this subject must have been far more accurate and comprehensive than any which had preceded them. Many of the technical terms of this science which are in use at the present time were first employed by him. The *duodenum* derives its name from him, signifying the length of twelve fingers in breadth. To the pulmonary artery he gave the name of the *arterial vein*, on account of its arterial structure and venous function. He was the first to describe the sinus which still bears his name, the *torcular Herophili*. He also applied the name *calamus scriptorius* to the angular indentation in the posterior part of the medulla oblongata, which forms the floor of the fourth ventricle, on account of the resemblance, not to the Roman *stilus*, but to the reed used sometimes by the ancients as a pen for writing, of which the best sorts came from Egypt and Cnidos.

[To be Concluded.]

# EDITORIAL DEPARTMENT.

## ABDOMINAL SURGERY.

It is very probable that the surgical art has made more rapid and sure advancement during the last fifteen years than for the preceding century. This cannot be attributed to the wider knowledge of anatomy upon which surgery is so directly based, for little has been added to our knowledge of general or structural anatomy since the days of the Fathers. In large share it has been due to a better understanding of diseased processes, the causes of so-called inflammatory and other changes, and means to prevent or lessen the dangers which had been observed to ensue. It is here that the teachings and demonstrations of Prof. Lister have been so very valuable to the profession and our race.

It is very probable that recourse to gastrotomy was first had in the cases of malformed pelvis, where it was impossible to deliver in the normal manner, and Cesarean section was undertaken in the hope of saving the child if not the mother.

To this abdominal surgery was limited, with the exception of strangulated hernia, until within the present century.

The graduates of the last decade were taught that the peritoneum was sacred from the ante-mortem touch of the surgeon, that peritonitis was expected to follow, and death the almost necessary result. I shall never forget the sickening horror which oppressed me when, a surgeon in our late war, I was summoned to see a soldier, where a small portion of the abdominal wall had been carried away by a piece of shell, and several folds of the small intestine had escaped; nor have I forgiven myself, when I remember that I made no effort at closure of the wound, being content to make comfortable as I was able the poor sufferer, while waiting for the death which I felt was inevitable.

Under suitable precautions, the peritoneum is subjected to surgical manipulations almost without fear or danger. Let us suppose it granted that such precautions mean a careful surgical knowledge and skill, combined with that much rarer talent a discriminating judgment and sound common sense to be exercised, as to the *when* as well as to the *how* of operative interference, supplemented by a belief in, and familiarity with, antiseptic treatment of wounds.

At the beginning I will acknowledge that the views here presented may represent the position of the advanced guard, rather than the conservative element of our profession. While in spirit I confess myself as emphatically enrolled in the first, I would not hold in light esteem the ripe judgment of our fathers in surgery, of which number, fortunately, there are many who vie with the younger in the acceptance and development of new truths.

A natural sub-division of the subject would first place under consideration the operations confined to the abdominal wall. This includes wounds of accidental character, which should always be carefully closed after attention, such as the case may demand, has been given to the condition of the cavity and its contents. Dr. Hunter McGuire, of Richmond, in the annual address upon surgery at the May meeting of the American Medical Association, read a very valuable paper upon Gun-Shot Wounds of the Peritoneum. In his judgment, operative interference should frequently take the place of the expectant plan usually followed, and he cited from his experience in civil and military service cases in illustration. He was fully convinced that the patient many times would exchange an almost certain prospect of death for a good chance of recovery.

The abdominal cavity should be freely opened, and, if intestinal wounds exist, they should be closed with animal ligatures, great attention being paid to cleanliness and subsequent care.

Exploratory incisions are now employed with great safety, the object of which is to obtain a more certain knowledge of the conditions of the contained organs.

The failing to cure the large class of individuals rendered in a greater or less degree invalids by hernia, has been an opprobrium of the surgical profession for the ages, and our books are full of devices of rare ingenuity to meet the demand. It is believed that the animal suture, antiseptically applied, offers, in a very large number of cases, a safe and permanent cure. My first use of it was in 1870, when, after operating for strangulated hernia in a patient harassed with a severe cough, it occurred to me to close the walls of the ring to retain the intestines. I closed the pillars of the ring, long widely separated by a reducible hernia, with cat-gut, the external wound with silk, and treated antiseptically. The recovery was speedy, and, to my surprise, the hernia was cured, and although the asthma and cough remained, the patient, who lived six years after, had no return of the hernia. Since, I have operated many times in all the varieties of hernia with equally favorable result. My first cases were published in the Boston *Medical and Surgical Journal*, in 1871, and an article was contributed upon the subject to the American Medical Association, in 1878, and from this copied largely and reviewed. The operation has been repeated by some of the best known surgeons upon both sides of the Atlantic.

As more recently done, I have substituted tendinous ligatures for the cat-gut, and used the continuous suture instead of the interrupted. This suture appears preferable, since we thereby secure a better coaptation of the parts, and have less knots to possibly loosen, while the over-and-over stitch more uniformly compresses the inclosed tissues, and each in a measure compensates and equalizes the tension brought to bear upon the parts, causing less irritation and disturbance of nutrition and repair.

The tendons of the moose and caribou antiseptically prepared are preferable. The tendons of this class of animals differ considerably from the domestic animals, since they are almost entirely free from fat, while they are of sufficient length for surgical purposes, and having straight parallel fibres are much stronger than the twisted ones of the sheep's intestine, and are not so readily absorbed. The tendinous rings of the hernial opening are refreshed; the peritoneal sac, if large, should be excised—in some instances may be included by the sutures; the external wound is then closed, with or without drainage, as deemed necessary. The tendinous sutures not only hold the parts in favorable apposition for repair, but, as has been histologically demonstrated, are replaced by bands of permanent reinforcement to the weakened rings. By this operation, Le Dr. Lucas Champoniere, of Paris, in his work upon Antiseptic Surgery, 1880, reports six cases with cure. Prof. Tilanus, of Amsterdam, published a monograph upon the subject at the International Congress, 1879. Carl Rossander, of Stockholm, in 1878, operated with complete success upon a child of only two years of age in an umbilical hernia.

America and England share very largely in the honors of the inauguration and development of ovariotomy. McDowell, Atlee, Peaslee, Kimball, Burnham, Dunlap, names in America immortal in this association, to be ever joined with those of Spencer Wells and Keith, in Great Britain. Mr.

Wells has quite recently tabulated his results; his cases in all, one thousand; of these seven hundred and sixty-nine have recovered. The last one hundred and twelve cases were all private, and performed antiseptically. The mortality, ten and one-tenth per cent. Mr. Keith's results are yet more favorable. Forty-eight consecutive cases without one death—unexampled in the history of surgery! Nearly all the leading operators have adopted antiseptic methods, and consider their advantage beyond dispute. Dr. Sims recently declared to me that the statistics of ovariotomy would have to be re-written, classified by this immortal innovation. The master of antiseptic surgery has in control his mortal enemy, septic-peritonitis. There is undoubtedly room for innovations and improvements, especially as to methods of treatment of adhesions and the securing of the pedicle. Enucleation, ligature and division with the cautery are supplanting, in large measure, the former favorite, almost exclusive, treatment by the clamp.

Even within the limits of this paper I would do manifold injustice to the subject did I omit reference to a most interesting and valuable communication entitled "A New Method of Performing Ovariotomy," by Dr. Noeggerath, of New York, published in the New York *Medical Journal*, January, 1881. In it antiseptic precautions are most thoroughly reviewed, yet that which is of greater value, because less understood, is the discussion of shock and the means by which it may be averted. Dr. N. thinks it caused by, or rather is another name for, reduction of temperature. To quote him, "the principal element of shock is the lowering of temperature." This is largely from peritoneal exposure, and the remedy which he proposes, and would seem to meet with approval, is the placing the patient upon a water bed heated to the degree required. Another modification, exclusively his own, consists in cutting down to the peritoneum and then tapping the cyst, thus lessening the period of peritoneal exposure, and the danger of introducing the contents of the cyst into the pelvic cavity. Dr. Noeggerath's views in reference to drainage in certain cases are also peculiar.

Recognizing the difficulty which most of us have experienced in making drainage from the peritoneal cavity anything like satisfactory, for the effused lymph agglutinates the intestinal folds into separate pockets, and on this account drainage therefrom must, in many instances, be impossible, the doctor had the courage to immerse in an antiseptic bath one most unpromising case which was followed by recovery, a careful history of which is given of most instructive character.

To say the least, it opens a new and very suggestive field for observation and study, and has an application far wider than in ovariotomy. Because of the enormous drain upon the vital forces by the loss of serum and fibrine, this treatment would be very severe upon weakened constitutions. We turn, with lingering regret, from this interesting field of surgical conquest; and while we make triumphant note of victories, and think of glory yet to be won, we should be unjust to every principle of honor or gratitude did we fail to note affectionately the long, uncompromising struggles of Dr. H. R. Storer as he grappled almost alone in Boston with the opposition to the new truths which he so thoroughly demonstrated, and into whose labors some of us have entered with more than a fair share of the honors which so worthily belong to our master.

In close relation to this subject belongs the yet unsettled question of the treatment of uterine tumors. To this subject we would gladly devote greater length than the possibilities of this note will permit. Dr. Storer collated twenty-four cases and eighteen deaths, and Dr. Thomas gathered eleven subsequent cases and ten deaths, following the removal of the uterus and the ovaries. But these cases were before the adoption of antiseptic surgery. Dr. Burnham, of Lowell, is believed to be the first in the world to have removed the uterus and both ovaries, followed by successful recovery. He has since operated upon fourteen cases. Dr. Kimball has removed the uterus fourteen times, with six recoveries. M. Péan, in 1873, reported seven recoveries in nine cases, and Dr. Thomas, in his paper upon uterine fibroids and their removal, in the Transactions of American Medical Association, 1880, reports seven cases and four recoveries, and during the present year he has operated once, followed by death. Spencer Wells, although at first refusing to operate, closing the incision if the tumor was found to be solid, reported, in 1878, twenty-four cases with fifteen deaths, all operated upon since 1861.

In the June number of the ANNALS OF ANATOMY AND SURGERY Lawson Tait publishes his experiences in hysterectomy for myomatous growths of the uterus, and from it draws the most unfavorable conclusions. While he gives his results with a candor and frankness altogether commendable and of great weight, coming from such a distinguished authority, there is a lack of definiteness and detail which greatly lessens the value of the paper as a contribution to this branch of surgery. It would appear that in all he had operated by abdominal section ten times with only two recoveries, and here by treatment of the pedicle by the wire clamp. In two cases "I attempted enucleation from the abdomen, but had to desist, and both patients died."

We infer he would state that he attempted to enucleate the tumor from the uterus, leaving the latter, and failed; if this is true, it would have been of the greatest value to know why he had to desist. I have operated twice, removing one intraperitoneal fibroid by enucleation followed by recovery. In the other case I failed to remove the tumor because of its vascularity, but the patient made a quick and easy recovery from the operation.

All three cases in which Mr. Tait treated the pedicle by ligature died from hæmorrhage, which he thinks no ligature can control, and yet he omits to mention in what manner he ligated. His operations for controlling the fibroid development by removal of the ovaries, are very gratifying—the first three cases with two deaths, and the last ten with only one death. We expected to have seen Battey's experience referred to by Mr. Tait in this connection, and it would have been instructive to have known if the operations were performed with antiseptic precautions. Mr. Tait's experience with intra-uterine tumors is fortunately widely at variance with the results obtained by many of our American operators.

A form of hysterectomy, introduced to the profession by Freund, of Breslau, and known as Freund's operation, consists in the removal of the entire uterus when affected by malignant growths. This has been quite successful, and in well-chosen cases is doubtless of the greatest value. At the Surgical Congress recently held in Berlin, Dr. Martin reported twelve cases of cancer of the uterus where he had performed vaginal hysterectomy. In four of these cases he was unable to complete the operation, on account of firm adhesions to the neighboring parts. Of the other eight cases six recovered. Patients were shown who were operated upon in October and November last, where there was, as yet, no recurrence of the disease. This operation has now been performed in Germany about fifty times, with a mortality of twenty-five per cent. Dr. Bartley's paper in the June number of the Annals is a most valuable contribution to this important field of research.

One of the most ingenious and daring operations is that of Prof. E. Porro, of Pavia, who first, in 1876, successfully removed the pregnant uterus, saving both mother and child. The operation is conducted in many respects like ovariotomy. The organ is opened and contents removed, the neck is constricted to control hæmorrhage, divided and secured like the pedicle in ovariotomy. Prof. Isaac Taylor reported a successful case at the New York meeting of the American Medical Association last year. The operation has been modified so as to turn out the uterine tumor and ligate the cervix before opening, in this way lessening the hæmorrhage and freeing the abdominal cavity from the danger of introduction of foreign elements at the expense of making a larger wound. Dr. R. P. Harris, in a recent paper, reports a total of thirty-six cases of Porro's operation, nineteen mothers and twenty-six children surviving ; of the last twenty cases there were twelve recoveries and eighteen children delivered alive.

Abdominal surgery gives promise of the safest possible outcome from tubal pregnancy, and where the condition can be predetermined, the wise procedure is to operate at once, and not wait for rupture or other possible consequent. Even if rupture has taken place and the condition of the patient is *in extremis*, the best chance lies in operation, securing the bleeding point and removing the effused fluids from the abdominal cavity.

Battey's operation is another variety of abdominal surgery, practised for the removal of ovaries when not very much enlarged from diseased processes, or for the arrest of fibrous growths of the uterus. This has a certain field for legitimate recognition, the definite value of which is yet *sub-judice.*

One year ago I reported a case to the Boston Gynæcological Society, and showed the specimens of complete removal of both ovaries and one dilated fallopian tube, and also a cyst of the right broad ligament. The patient made a fair recovery, but has continued to flow regularly, and in much too large quantity since the operation. In this instance, also, sexuality is in no wise lessened.

Simple reference only can be made to a variety of operations of general interest not belonging to the domain of gynesic surgery.

First, I would notice operative interference in acute perforated typhlitis. Dr. William Byrd, of Quincy, Ill., reported at the recent meeting of the Association at Richmond four cases with three recoveries. Dr. T. H. Burchard, of New York, has published an exhaustive article in the January number of the *New York Medical Journal*, 1881, upon the subject. There can be little doubt that surgery will here make a great advance over the present methods pursued in the treatment of these very dangerous cases.

The removal of the spleen is no new operation, but was first performed in Italy in 1549 successfully, and again by Péan in 1867. Here antiseptic surgery lessens in the same remarkable degree the dangers.

Under similar conditions of precaution nephrectomy promises to be an operation under certain circumstances to be justifiable, even demanded. I have allowed one patient to die who should have received at my hands the chance of life. Mr. A. E. Baker, of London, published a year ago a fatal case of his own, and with it a summary of twenty-eight cases, in which, for various reasons, the removal of the kidney had been attempted or performed. There were fourteen deaths, but excluding six cases of erroneous diagnosis with five deaths, there were thirteen recoveries and nine deaths, two of the latter cases so severe as to be left unfinished.

Abscesses of the liver and diseases of the gall bladder have been already subject to successful surgical treatment.

Among the late triumphs of abdominal surgery, we must include Prof. Billroth's successful case of resection of the stomach for carcinoma. More recently, Prof. Billroth has twice repeated his operation, but both cases terminated fatally. Dr. Wölfler, Prof. Billroth's assistant, has removed a malignant tumor of the pylorus, followed by recovery. This was done by Péan in 1879; patient died of exhaustion the fourth day. In 1877 Billroth operated upon a gastric fistula, followed by recovery.

Dr. Magdelung, of Bonn, read a very thorough paper on Extirpation and Uniting of Intestine, at the recent Surgical Congress in Berlin. A large number of preparations from dogs were exhibited, showing the advantage of the Lambert over the Jobert (or invagination) method. His experiments show that when the mesentery has been separated from too large a portion of the intestine, the nourishment through the intestinal wall is not sufficient, and the intestine becomes necrosed. Hence he advises that in ovariotomies, where a considerable portion of the omentum is adherent, and must be tied, the corresponding portion of the intestine be excised, and the ends united. He has collected forty-nine cases of excision of portions of the intestine, with thirty-six recoveries. These operations were nearly all performed by German surgeons, and do not include the recent stomach extirpations or Koeberlè's case, where over two metres of the small intestine was successfully removed. Czerny, in 1880, removed two portions of the large intestine for cancer, with recovery from the operation. Reybard, of Lyons, in 1833, removed four inches of cancerous descending colon, with recovery.

Thus all too briefly have we outlined the present condition of abdominal surgery, and no wise man would predict the future. For ourselves, we believe there is very much yet to gain.

Patients will not be allowed to die without the benefit or the chance to be intelligently given them. Twists, strictures of the intestines made by bands of adhesion, or even certain new growths, will be excised. Foreign bodies otherwise unable to be dislodged from the intestinal canal will be removed. The surgery of the future will demand the treatment of fibroid tumors of the uterus as surely as of ovarian disease to-day. We believe tumors of the uterus will be excised therefrom as from other organs, and the patient will not be condemned to a life of drawn-out misery, simply because the malady does not kill except at long range of years. Honorable as the past, glorious as the present, yet welcome the future of our art! I close with the sentiment of a trans-Atlantic writer of eminence, who finished his epistle to me recently as follows: "Medicine of the twentieth century—Sanitary Science and Surgery."

HENRY O. MARCY.

## ON GENITAL IRRITATION.

Our esteemed contributor, in his remarks on "Genital Irritation" in the present number, errs in stating that we deny, "by implication and argument, that there is such a thing as 'reflex paralysis' resulting from genital irritation." In our editorial on "Indiscriminate Circumcision," we stated, and still believe, that the operation of circumcision, as a remedial measure, should not be performed "for other than simple local or directly traceable genito-urinary troubles." We have no right to *deny* the existence of "reflex paralysis depending on phymosis and adherent prepuce," because we have never seen it—although we have, for many years, labored among the class where it is most likely to occur. We have seen apparently urgent symptoms follow "genital irritation" in the adult; but we have very great doubts as to the occurrence of "reflex paralysis" from the same cause *in childhood*, and we so stated in our editorial note. We should be greatly pleased to see such a case in a child, and to have the opportunity of examining it prior to circumcision, and to watch its progress after the operation.

Dr. Taylor also errs in supposing that the mistakes in diagnosis referred to in our editorial were "made by persons of insufficient opportunities." The greater number of cases referred to by us were diagnosticated and operated on by medical men of ample opportunity and experience; and while lateral sclerosis of the cord, as we understand it, is not difficult to recognize, the fact that a large number of cases of so-called "reflex paralysis" proved to be lateral sclerosis, we thought worthy of comment. But we have never seen a case of "sclerosis" that simulated, in any important respect, either hip-joint disease or any chronic joint lesion.

The questions introduced by Dr. Taylor, regarding "imperfect sexual hygiene," and its influence upon the emotions, open a wide field for investigation and study.

It is well known that we may have functional loss of power, either local or general, from, strictly speaking, emotional causes, without genital irritation. And it has frequently occurred to us that in many, and we have often thought in the majority, of these cases where genital irritation exists—especially in women—that we have as a *general* condition the exaggerated emotional element, and as a purely *local* one the genital irritation; and that the latter, in all but the exceptional instances, is *secondary*. In other words, the sexual excitement is induced by the peculiar mental state, and the irritation is far more frequently an *effect* than a *cause*. We do not deny that the reverse occurs, for we have seen undoubted instances where sexual abuse, brought about by opportunity or imitation, has produced a directly traceable train of symptoms. We make it a rule, in practice, to examine, whenever it is possible to do so, the condition of the genital organs, and it would be a matter of surprise to those who had not had this experience to know how frequently we find extensive genital irritation, especially in children, without any emotional or "reflex" symptoms whatever. But when the two are combined in the adult female—that is, when the peculiar mental state exists which brings about "sexual hunger," and there is also an irritation of the genital organs, we find a long array of symptoms which are, after all, nothing more than we would expect to discover in a marked hysterical temperament, aggravated by morbid sexual longings, and accompanied by a secondary genital irritation. We may at least state that in cases where the emotional element is lacking—and this is especially true in childhood—genital irritation, of the nature under discussion, produces little or no effect.

Thus it is that we doubt the effect of simple genital irritation upon the undeveloped sexual apparatus of childhood. Hysteria in childhood exists, and we have seen and reported marked instances of it; but genital irritation is not always present in these cases. Indeed, the worst instances we have met of what might be called infantile hysteria, were not associated with any perceptible irritation of the sexual apparatus. But we doubt not that had we circumcised, or performed clitoridectomy, they would have recovered, just as they did recover by the use of other measures which were quite as scientific, even if they were not so brilliant as those others might have used.

If the relation of genital irritation to disturbed emotionality was constant, or if it could be established that the former was primary, it would lead us to different conclusions. As this irritation is far from constant, and as observation teaches that the peculiar mental state precedes the local, and as further still the elimination of the genital irritation very frequently fails to modify the symptoms supposed to be dependent upon it, we must decline to accept the views advanced by Dr. Taylor and held by others. Indeed, even were it established that a removal of the genital irritation was followed by a modification of the morbid emotional state, it would prove very little for the cause of those who hold adverse views to those we have here expressed.

It has been our experience in the treatment of functional derangements, even those of the most confirmed type, that if we relieve the *apparent* cause, and especially if the patient imagines it to be *the* cause, we make what is oftentimes the necessary impression upon the patient's mental state, and in some instances a long train of effects will cease. Undoubtedly we should always treat the genital irritation when it exists, for we can scarcely hope to control the mental element so long as there is a source of irritation, be it primary or secondary, or even if it be unconnected with the genital apparatus.

In the case of Dr. Fruitnight's patient, related by Dr. Taylor, we think we recognize a patient who came to the New York Orthopædic Dispensary on August 11, 1880, while the surgeon in charge was absent. The patient was examined by Drs. E. D. Simpson, S. Ketch and A. Sydney Roberts, now of Philadelphia, members of the Dispensary Staff—the first named being surgeon in charge, *pro tem.* Dr. Simpson undoubtedly is the one referred to in Dr. Fruitnight's letter as the one who "who was unable to make a satisfactory diagnosis;" for not being able to reach a positive conclusion, Dr. Simpson referred the patient to Dr. E. C. Seguin, and accompanied the parents of the patient to Dr. Seguin's clinic at the Manhattan Eye and Ear Hospital, on the same day. Dr. Seguin was absent, but Dr. Clovis Adam, the assistant physician, examined the patient. The father then stated for the first time that the boy had recently recovered from an attack of diphtheria. Drs. Adam and Simpson then made, after further examination, a diagnosis of post-diphtheritic paralysis. The history, as we find it recorded upon the Dispensary books, sustains this diagnosis, and the well-known prognosis of post-diphtheritic paralysis lends strong confirmation to the assumption that "six weeks after the removal of the phymosis" (when the patient recovered, according to Dr. Taylor), nature had done her work unaided by the circumcision.

And so it has proved in every case of "reflex paralysis" in children that we have seen. A careful inquiry into the details of the previous history, and a painstaking study of the symptoms and condition, develops a cause for the "reflex paralysis" wholly unconnected with the undeveloped genital organs of childhood. And we further believe, with our present experience, that in those cases of so-called "reflex paralysis" in children, where recovery ensues after circumcision, that the patient would have recovered if other remedies had been used and had the operation been omitted.

NEWTON M. SHAFFER.

# ON THE SURGICAL ANATOMY OF THE SHEATHS OF THE PALMAR TENDONS.

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EVER since I first tried to get from the English text-books a somewhat accurate idea of the anatomy of the tendon sheaths in the palm of the hand, or, indeed, in other parts of the body, I have been disappointed. With reference to my particular subject, Gray makes no mention of it at all, Quain dismisses it in two lines (eighth ed., I., p. 211), and neither Wilson nor any of the ordinary reference works make any satisfactory explanation of their arrangement. The works on surgery are equally barren of allusion to the same. McDougall has given in Todd and Bowman's Cyclopædia of Anatomy and Physiology a very excellent description, which covers most of the ground, but he fails to lay sufficient stress on some very important points. Thus our literature is very deficient in this respect.

By all means, the best description of the parts, from a surgical point of view, is given by Gosselin in his "Clinical Lectures" (Lecture XL.). The only other article in our language bearing on this subject which has met my eye is a clinical lecture by Prof. Connor,[1] of Cincinnati. I may perhaps be allowed, then, at the risk of going over some familiar ground and thus appearing prolix, to call attention to some well known points in the anatomy of the hand, in order to bring out more fully the surgical bearings of my subject.

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[1] *Medical News and Library*, May, 1879.

And, first, the palmar aponeurosis and fascia. This is an extension from that of the forearm. Intimately blended with the anterior annular ligament, attached anteriorly to the styloid process of the ulna and radius and to the pisiform bone, it furnishes sheaths to those tendons which do not pass under the ligament and to the vessels. With these, however, we are not at present concerned. The anterior annular ligament is an exceedingly tough band stretched from the pisiform and unciform bones on one side to the scaphoid and trapezium on the other. Along with the concavity of the carpal osseous arch it forms an elliptical ring, of which I shall speak further along as the *carpal ring*. This ligament forms an insurmountable barrier to the progress of fluid or solid tumors, compelling them to protrude either above the wrist or in the palm. To the central portion of this ligament is attached the palmar fascia, which is largely derived from the extension of the tendon of the palmaris longus. This fascia divides near the distal extremities of the metacarpal bones into four bands, each of these is again halved to be attached on either side of the extremity of each bone and the proximal extremity of the first phalanx. Here each portion of the fascia is reinforced by strong transverse fibres, and thus each partition of the fascia is converted into a tough, fibrous arch, through which pass the flexor tendons. This fascia overlies the superficial palmar arch, the flexor tendons, the median and ulnar nerves, from all of which it is separated only by loose and extensible cellular tissue, which permits free play of the parts. This portion of the fascia presents numerous apertures through which the deep fat and cellular tissue communicate with the subcutaneous; and when the parts beneath are swollen, they may protrude, thus forming small herniæ which, becoming strangulated in these apertures, give rise to exquisite pain (McDougall, l. c.). This fascia gives off two sets of processes: the superficial set envelop the thenar muscles on one side, the hypothenar on the other; the deep set dives into the palm to form the interosseous aponeurosis. The sheaths of the flexor tendons of the fingers are osseo-aponeurotic canals, their fibrous portion continuous above with the palmar fascia, as just described, attached to the lateral ridges of the phalanges. Opposite the articulations these sheaths are thin, so as to permit free flexion, and may be easily destroyed in a careless dissection; or they may even be wanting just at this point, so that the synovial sacs of the tendons are directly in contact with the integumentary structure. Moreover, it is through these spaces that inflammation is propagated to the synovial membranes and joint structures in many cases of phlegmonous inflammation. Finally these sheaths are blended with and lost in the pulp and periosteum at the tips of the fingers. The beautiful arrangement of the tendons flexores sublimis and profundus is too well known to need further description.

Recurring now to the *carpal ring*, we find here a more closely packed aggregation of tendons than occurs elsewhere in the body, there being no less than nine tendons which pass through it, besides others which pass outside, but in close contact with it. These nine tendons are: one of the flexor longus pollicis, four of the flexor sublimis, and four of the flexor profundus digitorum. These tendons are enclosed in synovial structures of particular surgical importance, and all that has been given above was inserted simply to aid to a better understanding in this matter of the synovial structures.

In the great majority of cases the arrangement will be found to be this: There is a synovial bursa in the palm of the hand common to all the tendons, which, moreover, has two lateral digital prolongations along the flexor tendons of the thumb and the little finger, accompanying them until the osseo-aponeurotic canal above alluded to is lost. Furthermore, this common or central bursa has no direct connection with the synovial sheaths of either the index, middle or ring finger, these being distinct and limited. This central bursa overlies the periosteum of the metacarpal bones in the palm in front of the carpus on the synovial membrane of the carpal articulation; it extends far enough up on the forearm to permit free play of the tendons, and is lost in the intermuscular fasciæ, rather than found to terminate abruptly; and its prolongations to the thumb and little finger also sustain the same relations to the synovial membranes of the metacarpo-phalangeal and phalangeal articulations lying upon them. Communication with the other three fingers is cut off by firm attachments of the bands of palmar fascia, each finger having its own sheath. This is, as remarked, the *usual* arrangement; it may, however, vary. Communication with either the thumb or the little finger may, in rare cases, be cut off; or one or two of the other fingers may have its sheath connected with the common palmar pouch.

This anatomical condition I have a number of times demonstrated after careful injection and dissection. Sometimes I have used plaster of paris, at other times wax, paraffine and glycerine melted together. My method was to carefully dissect the forearm until I was able to get underneath the flexor profundus, and then to force down the injected substance through a long, tapering canula, using a moderate degree of force. These preparations have convinced me that, while it is in the main correct to speak of the common synovial pouch, and to regard the nine flexor tendons as playing loosely therein, there is still a slight amount of cellular tissue lying in the sac which seems to hold the synovia like a sponge, and to form a network through which the tendons play. It is, however, very easily disarranged and broken down, and offers no obstacle to injection, nor does it serve as a barrier to any inflammatory process or product. Once I found that the index finger was in communication with the palmar pouch; at no time did I find that either the ring or middle fingers were. In all cases I could find that my injecting material had run along the tendons of the thumb and little finger, and formed a more or less complete enveloping mass around the tendons in the palm, under the annular ligament, and up the forearm.

The full import of these anatomical relations can now be comprehended from a surgical standpoint. Who has not, for instance, met with cases analogous to this? A patient suffers from an inflammation, traumatic, or other, involving the little finger; soon the palm of the hand swells, and, though the other fingers may be somewhat sore and stiff, the thumb seems to "sympathize" most with the affected finger. And if this trouble shall still extend, it will be up the forearm rather than down the other fingers. Or another case: With a similar trouble in the middle finger, we have swelling, intense pain, sympathetic febrile disturbance, but no extension to the other fingers, and only a moderate degree of trouble in the palm. In this case it must be a phlegmon of exceeding severity, such as may be caused by a dissecting wound, which shall break down the barriers at the base of the finger involved, and thus spread to adjoining parts.

Since beginning this paper, my attention has been called to a phlegmon in the forearm of a cachectic patient, which, spreading, extended to the palm of the hand and caused the thumb and little finger to become much more swollen, painful and stiff, than the other fingers.

The extensive spread up the forearm, too, is not so very rare a complication, but is one of serious import. The tissues which form the synovial sheaths losing their identity in the intermuscular structures of the forearm, by no means lose their liability to destructive inflammation, but are peculiarly liable to it. They react almost like tinder, and in twenty-four hours a diffuse phlegmonous process may be set up all the way from the palm of the hand to the elbow. Once given such a disturbance in the depths of the fleshy part of the arm, and the patient's life may be put in extreme hazard from purulent or putrid infection, or consequent exhaustion. I may be allowed to quote Gosselin (loc. cit.), in his answer to Dolbeau, who held that these deep phlegmons of the forearm are due to a propagated lymphangitis, especially of the deep lymphatics. This cannot be, for the following reasons: 1. It lacks anatomical proof. 2. The suppurative process does not follow the great vessels, whereas the principal deep lymphatics do accompany them. 3. Such a theory does not account for the clinical facts that deep abscesses of the forearm do so often follow injuries to the thumb and little finger, and not those to the other fingers whose synovial sheaths are independent. 4. It does not account for the gravity of the sequelæ, the adhesions of the tendons and consequent deformity or impairment of motion.

There remains little more to be said. We should be strictly on our guard, with reference to the above matters, in all injuries to the hand, especially those involving the thumb or little finger. In the matter of treatment, hot applications assiduously attended to, in connection with such anodynes as may be needed, constitute the therapeutic applications. The instant indications of suppuration are perceived, the knife is called for. Incisions in the palm should be made deep, and directly over the middle of the metacarpal bones, in order to keep clear of the digital vessels and nerves.

The location of the palmar arches should be borne in mind, keeping in front of a line drawn from the metacarpo-phalangeal articulation of the thumb to the hypothenar eminence. No hesitation need be felt about making as frequent incisions as may be indicated, since the surgeon's knife, judiciously used, cannot cause any worse condition of affairs than do the ravages of a deep phlegmonous or erysipelatous inflammation. Anæsthetics should be resorted to each time an incision is made rather than allow a patient's lack of fortitude to interfere with evacuation of pus.

If we are called to treat one of those lamentable cases where the whole forearm is the site of a deep seated phlegmon, anæsthetize the patient, and make careful but free dissections with the aid of the grooved director rather than inflict injury upon important vessels and nerves by the too free plunge of the bistoury. If, in spite of good treatment, adhesions have been contracted in tendon sheaths, a well directed but gentle *massage*, aided by communicated motions, will often effect considerable improvement.

# A CASE OF BOTTLE IN THE RECTUM, SUCCESSFULLY REMOVED.

By L. A. RODENSTEIN, M. D.,

OF NEW YORK.

CHAS. W., a coachman, had for a long time suffered with hemorrhoids. A friend and fellow-sufferer, as a last resort, recommended dilatation of the sphincter ani by the introduction of a bottle into the rectum. He obtained a six-ounce medicine bottle, broke off the neck, ground off the rough edges, and on the fourth of July, 1878, holding the bottle firmly by its bottom, succeeded in introducing its conical end fairly into the rectum. He was just congratulating himself that at last he had hit upon a sure relief when, to his horror, the bottle slipped from his hand and disappeared in the gut. The distension of the bowel had created a vacuum which drew the bottle into the gut. He had introduced the bottle at 7 A. M., and had mowed grass all day. At 7 P. M. I saw him; he had already taken a dose of castor oil to bring on an evacuation in hopes of ridding himself of the bottle, but without success. I introduced my index finger into the rectum, and touched what seemed the bottom of a good-sized bottle. I insinuated one finger after another until I had introduced the whole hand. Vain efforts to grasp it and make traction caused it to ascend further up the rectum. The pressure upon my hand now became so great that it lost all sense of touch. I persevered, however, using first one hand then the other, but only to find that the bottle was being carried farther up, till it had become engaged in the sigmoid flexure, where it remained.

Four hours having been spent in these ineffectual attempts, two other practitioners were summoned to assist me. At first they repeated my efforts, but likewise without success. The patient was then chloroformed. Upon then introducing my hand into the relaxed bowel, I found that the bottle had passed along the descending colon, having overcome the constriction of the sigmoid flexure and had followed the transverse colon until it had become fixed in the right iliac fossa at the cæcal pouch. As for extracting it, it seemed out of the question save by operative interference. On external manipulation, to find the precise location of the bottle, I had no difficulty in locating it, and found the neck of it in the right iliac fossa near the cæcum. The idea was suggested that, as it had been pushed by my hand to its present position, it could also be pushed back by pressure from the outside. The patient was put on his left side, his knees being well drawn up to relax the abdominal muscles; one of my colleagues inserted his arm up to the elbow into the rectum to guide the bottle, and found it was at that moment lying lengthways in the transverse colon, which I also could plainly feel through the abdominal walls. I pushed and manipulated with all the force I dared use, my assistant, meanwhile, guiding with his inserted hand. We made rapid progress until we reached the sigmoid flexure, when we came to a standstill. It seemed at that moment as if we were again to fail, but I kept up a constant and strong pressure, aided by the patient who had come out from the influence of chloroform and bore down constantly. By lying partly on the bed facing the patient, my fist pressing upon the opening of the bottle, my elbow resting upon my hip, and my feet braced against the wall, I was enabled to use all my strength; the obstruction finally yielded, and the bottle, or the patient, was soon safely delivered. There was resistance at the sphincter ani, but it was soon overcome.

The bottle was partly filled with liquid fæces; it proved to be an ordinary 6-ounce bottle of the apothecaries', with its neck broken off, making a cylinder four and one-half inches long, and two and an eighth inches in diameter.

The following points are worthy of note in connection with this case:

1. The rapid distension of the bowel when the conical body was introduced.

2. The severity of the pressure upon the hand and arm when in the bowel, both by the sphincters and muscular coat of the intestine, paralyzing the hand and destroying the nicety of the sense of touch.

3. The folly of anæsthetizing the patient in the hope of rapidly grasping and extracting the introduced body, as in this case the bottle was thereby drawn further up into the bowel. But for the anæsthetic the bottle would not have passed the sigmoid flexure.

4. The value of the patient's efforts in bearing down in accomplishing the final delivery.

I might mention here that we made many attempts both to grasp the bottom of the bottle by forceps and also to engage its opening and draw it down by means of hooks of different sizes and shapes, but they were useless.

I append a few of the most noted cases of foreign bodies in the rectum.

Dr. Weigand, of Würtemburg, relates a case of a farmer who introduced a cylindrical piece of wood (the end of a bean pole) 5 inches long high up in the rectum; was treated by castor oil, and the wood was expelled after thirty-one days.

Dr. Dahlenkampf, of Heidelberg, reports the case of a man sixty-five years old who, when in the woods, was compelled to stool; while in a crouching position his foot slipped and he fell. He felt a sharp pain in the anus and also in the rectum; from that time had difficulty in defecation, and only rested by lying on his belly, and not until ten years afterwards was a piece of oak with the bark still on, 4½ inches long, removed.

Dr. Tompsett removed, by means of a long polypus forceps, a match-box 6 inches in circumference and 2¼ inches in length. Desault's case of a man æt. 47, who entered the Hotel Dieu to have a crockery vessel extracted from his rectum. This vessel was a preserve jar, the handle of which was broken and the bottom detached. It was conical in shape, 2 inches in diameter and 3 inches long.

1838. Cumano extracted from the hollow of the sacrum a 2-inch bottle by means of forceps.

1848. Parker reports a unique case of a man æt. 60 who, in a house of prostitution, forced a goblet 2½ inches in diameter and 3½ inches long into the vagina of his partner. She, for revenge, when he was completely intoxicated, pushed the bottom of the goblet into his rectum until the entire goblet had disappeared. It was removed by breaking it and taking it away by piecemeal.

1878. A person æt. 40 introduced a wooden pepper-box, 1¼ inches long and one inch wide, in his rectum; had done so for twenty years; at last had to be removed by forceps.

1835. A young man contemplating suicide introduced a fork in his rectum; violent pain which he suffered made him repent and obtain aid at the Hotel Dieu.

In the history of the American war a sailor, who introduced into the rectum a stone 5¼ inches long and 3 wide, was relieved successfully by gastrotomy.

1878. Studsgaard related the case of a postman who, in order to check an annoying diarrhœa, introduced into the rectum a mushroom bottle, neck uppermost; he was anæsthetized with chloroform, but the bottle which, previous to the narcosis, had been felt in the rectum, slipped further up; the bottle could be felt through the abdominal walls along the median line on the left side, the bottom being near the horizontal ramus of the pubis, laparo-enterotomy, through the median line, was successfully performed. The bottle was 17 centimetres long and 5 in diameter.

1853. Mr. Sacy removed from the rectum of a lady, piecemeal, a mass 15 inches in circumference, consisting of concentric layers of a compound of earthy and ferruginous matter, with many thousand strawberry seeds.

The late Prof. Chas. Budd presented a specimen at the New York Obstetrical Society—a mass of fæcal accumulation over 15 inches in circumference which he extracted from the rectum of a lady; she had suffered for months, and had been treated for chronic diarrhœa. The mass had a hole in the middle, through which a continuous liquid discharge was passing. The obstruction was removed in two parts by means of the short obstetrical forceps.

Nolet relates the case of a monk who, in order to relieve himself of a violent colic, introduced into his rectum a bottle of Hungarian wine, having previously made a hole in the cork to admit the wine into the intestine. It slipped out of his fingers, and a small boy was found to introduce his hand; he reached the bottle and drew it out.

1813. Tuffell removed a flask of crystal from the rectum of a patient, but was obliged to break it in removal.

1777. Buzzani extracted from the rectum of a man a teacup; it had to be broken.

Morand removed, with a pair of lithotomy forceps, from the rectum of a man sixty years old, a large knitting-sheath of boxwood, 6 inches long.

M. Bonhomme extracted from a weaver, who had long suffered from constipation, a shuttle with its roll of yarn.

Marchetti mentions the often-told story of the students of Gœttingen, who introduced into the rectum of an unfortunate woman all excepting the small end of a pig's tail, from which they had cut enough of the bristles to render it as rough as possible; it was successfully removed by pushing a hollow reed over the pig's tail, thereby protecting the anus and removing the offending cause easily.

Constance relates the case of a man who fell on an inverted blacking pot, forcing it up his rectum. The pot was removed in pieces after breaking it.

Mr. Thomas relates the case of a gentleman who, by the advice of a physician while in Paris, introduced a flexible cane, about the thickness of a finger, daily into his rectum for the purpose of overcoming obstinate constipation. This plan worked well, and excited a stool regularly, until one morning, being in great haste, he carelessly forced it up farther than usual, when it was suddenly sucked out of his hand up into his body beyond the reach of his fingers. Severe pain set in, an examination was made, and the upper end of the stick was plainly felt through the parietes of the abdomen midway between the ilium and the umbilicus on the left side; this end had evidently passed through the sigmoid flexure and entered the tract of the transverse colon. This case was treated by cathartics until the lower end could be reached by the hand and extracted; its length was 9½ inches.

# EXCISION OF THE LOWER FOUR AND A HALF INCHES OF THE RECTUM, FOR CARCINOMA.

### By GEORGE R. FOWLER, M. D.

E. SACKMAN, aged 34, German, photographer. For three months prior to coming under my care this patient suffered from rectal tenesmus, pain during and after defecation, and occasional hæmorrhage. For the last month of this time there had been a discharge at times of offensive fluid resembling the washings of meat. For the two months there had been progressive emaciation. No family history of carcinoma. Examination by finger revealed an infiltrated mass occupying the anterior and lateral rectal walls, the upper limit of which could be barely reached by the finger-tip with the knuckles well buried into the perineum. Dr. L. S. Pilcher, having confirmed my diagnosis of malignant disease, and concurring with me in the advisability of attempting the removal of the growth, March 19th was appointed for the operation.

Upon the day of operation the patient was ordered two ounces of brandy every hour. He had taken, by one o'clock, twelve ounces of the stimulant, and when placed upon the table, he was in a state of complete alcoholic intoxication. He was brought rapidly under the ether by Allis' inhaler, and the operation of excision of the rectum performed, in the presence of, and assisted by, a number of professional friends, as follows:

The bladder having been emptied, and a full sized sound passed, two lateral semi-lunar incisions were made about an inch from the anal margin, each commencing in the centre of the perineum, and terminating about an inch in front of the point of the coccyx. The integument, subcutaneus cellular tissue and sphincter ani muscles were dissected up until the external surface of the rectal wall was exposed. The dissection was now continued up the exterior of the rectum by means of the handle of the scalpel and the fingers, carefully detaching the tube from its surrounding attachments. The levator ani muscles were divided by blunt scissors. The upper limit of the growth having been reached, the mass, together with the gut, was drawn down by means of a pair of ovarian pedicle forceps. The hæmorrhage up to this point was kept perfectly under control by means of forcipressure. The growth being steadied by an assistant, I passed the fingers of my left hand above and below the growth, and with Emmet's right-angled scissors, using my fingers as a guide, I rapidly cut across the rectum at about four and a half inches from the external sphincter, and then completed the enucleation of the growth. The hæmorrhage at this juncture was frightful. Sponges wrung out of ice water were pressed in quick succession in the gaping wound, and several attempts made to discover the source of the bleeding, but without avail. In this emergency I extended the posterior angle of the wound directly backward to the tip of the coccyx. This enabled an assistant upon either side to retract the parts efficiently, and brought the vessel into view, where it was secured by a chromicised cat-gut ligature. It seems to have been a rather large sized transverse perineal artery.

After sponging the parts thoroughly, it was ascertained that the peritoneal cavity had been invaded, a knuckle of small intestine protruding from the wound. This was carefully returned after being thoroughly cleansed with a one to forty solution of carbolic acid. The cross section of the rectum had involved about an inch and a half of the recto-vesical reflection of the peritoneum, and through the rent thus made the intestine had escaped. This rent was at once closed by six chromicised cat-gut sutures so placed as to bring into apposition the edges of the divided peritoneum. A glass tube was placed into the opening of the stump of the bowel to facilitate the passage of gas, and antiseptic marine lint packed loosely about the parts; the wound was left open otherwise, as recommended by Cripps, for free drainage and irrigation. One hour after the removal of the patient from the operating table his condition was exceptionally promising, in view of the character of the operation, and the great loss of blood which he had sustained. Under the free use of ammonia, and brandy hypodermically, reaction was prompt and decided.

The wound was irrigated every two hours during the night, the loose oakum being removed from about the parts for that purpose. The following day, it being found that this frequent irrigation and the disturbing of the patient consequent upon its proper performance was objectionable, the plan of constant irrigation was adopted. This consisted essentially in filling a large wash-boiler with one to one hundred and twenty solution of carbolic acid and placing it upon a table conveniently near the bed. A siphon tube of soft rubber conveyed this solution in a small stream to the deepest portion of the wound, and this tube was held in position by a cross-bar made of deal board placed across the buttocks, and there supported by tapes attached upon either side to a bandage passed around the patient's waist. The above-mentioned rubber siphon tube passed through a hole in this cross-bar; the hole being somewhat smaller than the outside diameter of the tube, the latter was held securely in position wherever adjusted. Provision for the escape of the waste fluid was made by having a hole in the mattress and bed, underneath which was placed a vessel. By means of this apparatus a constant stream of carbolized water was kept running over the surfaces of the wound and the accumulation of effete matters prevented.

The glass tube was permanently removed from the stump on the second day, it being found to produce considerable irritation. The wound being now left open without any dressing whatever, the gases and fecal matters escaped without any trouble. During the first week it became necessary to empty the patient's bladder with the catheter ; after this time he regained control of it.

The further notes of this case, as kept by my faithful assistant, Dr. C. D. Beasley, shows a constant and uninterrupted progress toward recovery. There developed not the slightest sign of peritoneal inflammation, notwithstanding the invasion of the peritoneal cavity and the protrusion of the small intestines. The highest pulse and temperature were reached on the afternoon of the second day; the former being 120 and the latter 100½°. At this time the surface of the wound looked gray and sloughy, and there was a mingled septic and fecal odor emanating therefrom. Immediately upon the establishment of the permanent irrigation, these quickly vanished, the pulse lowered, and the temperature fell to 98½°; the latter did not reach 100° again during the after treatment. During the operation the atmosphere of the room was kept constantly charged with carbolized vapor from a large steam atomizer, all sponges and instruments were kept in carbolic solution when not in actual use, and every effort made consistent with the peculiar anatomical relation of the parts operated upon to carry out the antiseptic principle. The bowels, during the period when he was confined to his bed, were allowed to move at will, dependence being placed upon the constant carbolic irrigation to ensure cleanliness. When a larger mass than usual became lodged in the wound, the patient would quickly become aware of the fact, and dislodge it with the handle of a spoon. His appetite became better than before the operation, and he was allowed to indulge it in moderation.

On the twenty-seventh day after the operation, constant carbolic irrigation having in the meanwhile been kept up, the wound was considered sufficiently far advanced as to preclude the possibility of septic absorption under ordinary circumstances. I therefore applied dressings of antiseptic marine lint and Peruvian balsam; the patient was ordered to remove these dressings as often as there seemed to be any fecal accumulation, and to thoroughly wash the parts at such times before renewing the same; he likewise was allowed at this time to walk about his room, and to sit upon a ring-shaped air cushion. In about a month from the operation he was restored to society as a useful member thereof. The wound has healed completely, and the parts have a remarkably natural appearance. The patient has some control over the movements of the bowels; in fact, the cicatricial tissue surrounding the opening into the gut has contracted to such an extent as to make it necessary for him to make use of a rectal bougie occasionally, and also to render the movements somewhat fluid before they will pass comfortably. There is a slight prolapse of the mucous membrane of the bowel upon one side; the integument is joined to the edges of the stump of the bowel firmly and evenly around its circumference by cicatricial tissue. The patient has steadily improved in strength and weight, and to-day is in far better condition than at any time within six months prior to the operation.

The chromicised cat-gut sutures with which the rent in the peritoneum was closed were never seen afterwards, nor was any attention paid to either them or the ligature placed upon the transverse perineal artery.

# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

### A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

## XIV.—HEROPHILUS AND ERASISTRATUS.

### THE MEDICAL SCHOOL OF ALEXANDRIA (Concluded).

B. C. 320—250.

A REMARKABLE acquaintance with the anatomy of the nervous system was displayed by Herophilus. He seems to have been the first to recognize the distinction between the nerves of sensation and those of motion, and yet his ideas were so crude that he included a third or spurious kind of nerves which served to connect the bones, and for the attachment of muscles, etc.; structures which are now described as ligaments, tendons, and fasciæ. He traced the nerves of sensation to the brain, and the motor nerves to the spinal cord. He distinguished the cerebrum from the cerebellum, and described the thin membrane which covers the brain and lines the ventricles, and named it the *choroid*.

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He believed the brain to be the seat of sensation and the centre of the nervous system. He located the residence of the soul in its ventricles—an idea which was quite recently maintained, but modified by the German physiologist Sömmering (1796). Herophilus carefully dissected and described the tunics of the eye, and was the first to designate two of them by special names, the *tunica arachnoides*, and the *tunica retina*. It is said that he is the first surgeon who operated for cataract, which he did by extracting the crystalline lens. He observed the difference in the thickness of the venous and arterial coats, and said that the latter were six times as thick as the former. He also observed the varied force, tenuity and quickness of the pulse, and taught that there was an inherent rhythm in its movements, not unlike that of music, and that this varied in the different periods of life. He did not believe that the pulsating force resided in the arteries, but that it was derived from the heart. He attributed paralysis to a cessation of the vital force, and believed that sudden death often resulted from paralysis of the heart. This remarkable idea of Herophilus is preserved in Cœlius Aurelianus (Chron. lib. ii., c. i.). He observed the lacteals and noted the difference between those vessels which terminated in the mesenteric glands and the veins which passed to the liver. He, however, did not comprehend their character and function.

Herophilus is to be regarded as the inventor, or father of pathological anatomy, having been the first person that thought of opening the bodies of men after death in order to discover the character and course of the diseases which had caused their dissolution. Galen esteemed his authority so highly that he considered his knowledge of anatomy as absolutely perfect. And even a few centuries ago Gabriel Fallopius, in his admiration of him, calls him the evangelist of anatomists, and says that he would almost as soon think of contradicting the Gospel as the authority of Herophilus. He was the first who wrote commentaries on the aphorisms of Hippocrates, and it is interesting to know that his manuscript still exists, and that it is preserved in the Ambrosian library in Milan.

I should have mentioned that he wrote a treatise on obstetrics, which, like his other works, has not survived the ravages of time. He studied the female organs of generation, and noticed the different appearances presented by the os uteri in its natural state, at the time of menstruation, and during pregnancy.

He was a heroic therapeutist. He administered large doses of medicine, used drastic purgatives, and resorted to compound medicines in complex disorders. It was largely due to his example and influence that the system of polypharmacy, so characteristic of ancient times, and which culminated in the celebrated Mithradatium, and the Theriaca Andromachi, each of which contained more than three score of simples, had its origin. So great was the fame of this Ptolemaic physician that his followers constituted a sect, which existed for a long period, its disciples being designated as Herophilites.

Erasistratus, the contemporary of Herophilus, and his associate, in founding the splendid medical school of Alexandria, was one of the most celebrated physicians and anatomists of antiquity. It is said by Suidas that he was born at Julis (the modern Zea), in the island of Ceos; by Stephanus Byzantius, at Cos; by Galen, at Chios; and by the Emperor Julian, at Samos. Almost equal confusion exists as to his parentage. Pliny says he was the grandson of Aristotle by his daughter Pythias, while Suidas affirms that he was the son of Cretoxena, the sister of the physician Medius.

He was the pupil of Chrysippus of Cnidos, Metrodorus, and apparently of Theophrastus. He lived for some time in Syria, and was one of the court physicians of the king Seleucus Nicator, for it was while acting in this capacity that the oft repeated story of his tact and skill in the cure of Antiochus, the king's eldest son, is related of him. Since but few facts concerning his personal history are known, and as the good old story is one relating to our own profession, which may have been forgotten by some of my classical friends, and possibly unknown to other courteous and gentle readers of my sketches, I beg the privilege of repeating it here.

Antiochus fell violently in love with the young and beautiful wife whom his father had married in his old age, but did not disclose his passion, and chose rather to pine away in silence. Stratonice was the daughter of Demetrius Potiorcetes, and she had already born Seleucus one child. The other court physicians were quite unable to discover the cause and nature of Antiochus' disease, and Erasistratus himself was at a loss at first, till, finding nothing amiss about his body, he began to suspect, from his downcast look, the pallor of his face, the feebleness of his voice, and the emotionless tears which he shed, that it must be his mind which was diseased, and that he might perhaps be in love. This conjecture was confirmed when he observed his skin to be hotter, the color to be heightened, and his pulse quickened, whenever Stratonice came near him, while none of these symptoms occurred on any other occasion; and accordingly he told Seleucus that his son's disease was incurable, for that he was in love, and that it was impossible that his passion could be gratified. The king wondered what the difficulty could be, and asked who the lady was. "My wife," replied Erasistratus; upon which Seleucus began to persuade him to give her up to his son. The physician asked him if he would do so himself if it were *his* wife that the prince was in love with. The king protested that he would most gladly; upon which Erasistratus told him that it was indeed his own wife who had inspired his love, and that he chose rather to die than to disclose his secret. Seleucus was as good as his word, and not only gave up Stratonice, but also resigned to his son several provinces of his empire in upper Asia.[1] For this valuable service, Pliny informs us, Erasistratus received one hundred talents, which is equal to more than one hundred and twenty thousand dollars of our currency. This story has been told with more or less variations by several ancient authors. Many painters and engravers have exercised their art in illustrating this fine old story.

Some time after this event, and when he was quite advanced in years, Erasistratus betook himself to the city of Alexandria, the better to gratify his taste for anatomical pursuits, to which he devoted his time and energies almost to the entire abandonment of the practice of medicine. These researches were richly rewarded by many important discoveries. The same fate, however, which befel the writings of Herophilus was no less disastrous to those of Erasistratus. Oblivion has so far concealed them that only fragments which are scattered through the works of other ancient authors have survived, and they furnish us with scanty material wherewith we can form but an imperfect idea of the extent to which he carried his investigations, or how fully he may have recorded the same. We can form some opinion of the extent and importance of his writings, however, from the titles of his works, which, with some interesting extracts found in Galen and Cœlius Aurelianus, have been preserved from complete destruction. We find that he wrote treatises on anatomy, wounds, causes and treatment of disease, on fevers, on hygiene, and on medicines and poisons.

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[1] Smith's *Dictionary of Greek and Roman Biography and Mythology*, v. ii., p. 43.

He appears to have left this famous city some time previous to his death, which is supposed to have occurred after he had attained a good old age, as Eusebius informs us that he was yet living in the year B. C. 258, which was about forty years after the marriage of Antiochus and Stratonice. It appears that he died in Asia Minor, as Suidas mentions that he was buried on Mount Mycale, opposite Samos, in Ionia, whence arose the surname of Samian which several authors have assigned him. He had numerous pupils and followers, and a medical school, or sect, bore his name for several centuries after his death. Among the celebrated Erasistratians were Artemidorus, Chrysippus, Heraclides, Ptolemaeus, and Xenophon of Cos.

He enjoyed the inestimable advantage of dissecting the human cadaver, and it is said of him, as well as of Herophilus, that he made human vivisections. He bestowed special attention upon the brain and nervous system. He distinguished the nerves into those of sensation, and those of motion. The former he at first believed to be hollow, and to spring from the membranes of the brain, while the latter he believed to arise from the substance of the brain and cerebellum. A more minute examination convinced him that both proceeded from the great nervous centers, and not from their membranes. The following is his own account of his observations on the brain and nervous system. It is extremely interesting to read his own words, which have been preserved for us through so many long centuries of time.

> "We examined what the nature of the human brain was; and we found it divided into two parts, as it is in all other animals. Each had a ventricle or cavity of a longitudinal form. These ventricles had a communication with each

other, and terminated in a common opening, according to the contiguity of their parts, reaching afterwards to the cerebellum, where there was also a small cavity; but each part was separated from the other, and shut up in its proper membranes; and the cerebellum in particular was wrapped up by itself, as well as the brain, which, by its various windings and turnings, resembled the intestinum jejunum. The cerebellum was in like manner folded and twisted different ways, so that it was easy to know, by seeing it, that, as in the legs of swift-running animals, as the deer, the hare, and some others, we observe the tendons and muscles well calculated for that purpose; so in man, who has a larger share of understanding than other animals, this great variety and multiplicity of foldings in the brain was undoubtedly designed for some particular end. Besides, we observed all the apophyses, or productions of the nerves which came from the brain; so that, to state all at once, the brain is visibly the principle of everything that passes in the body; for the sense of smelling proceeds from the nostrils being pierced, in order to have communication with the nerves: the sense of hearing is also produced by the like communication of the nerves with the ears: the tongue and the eyes receive also the productions of the nerves of the brain."

He appears to have also studied the heart and vessels with much care. He pointed out the valves at the termination of the vena cava, and, according to Galen, believed their function to be the prevention of the blood, which had once reached the heart, from returning into the veins. By some authors it is supposed that he had almost discovered the circulation of the blood. He maintained that both the arteries and veins arise from the heart, though he believed the veins only are blood vessels, and that the arteries are empty of blood in health and filled with air, pneuma, or vital spirit, and that the pulsations of the arteries were due to the movements of the pneuma. The hypothesis that the arteries are air vessels, and not blood tubes, was entertained as far back as the time of Aristotle, and continued to exist until the time of Galen, who first proved by direct experiment that the arteries are always filled with blood, as are also the veins. The ancients could not comprehend why there should be two distinct sets of vessels for the conveyance of the same fluid. Erasistratus maintained that the air passed into the left ventricle, or, as he called it, the pneumatic ventricle of the heart, where it became changed by the principle of life from common air to spiritual air, and that from thence this vital spirit was distributed to every portion of the body by means of the arteries. His belief in the doctrine of the absence of blood from the arteries has been adduced as a certain proof that he could never have performed dissections of the bodies of living men, or even of live animals. When only the veins carried blood, and the arteries were filled with vital spirits, then perfect health was maintained; but the entrance of blood into the arteries, which he admitted to sometimes occur, was abnormal, and the source of disease—fevers, when it entered some noble part or into a great artery; and inflammations, when it found its way into the less noble parts or in the extremity of the arteries. The sole purpose of breathing was to fill the arteries with air, the air distended the arteries and made them beat, thus the air caused the pulse. He rarely resorted to venesection, so popular in that day, as he feared that bloodletting would increase the tendency of the blood to pass from the veins into the arteries; he substituted the use of ligatures around the limbs for this operation. His treatment was characterized by mildness, being almost diametrically the opposite of that followed by Herophilus. He was opposed to the use of purgatives, and used, instead, mild enemata in small quantities, rather than the copious and irritating clysters then in vogue. He advised abstinence, diet, regimen, bathing, friction, and exercise, used the simplest of vegetable medicines, and reprobated in unmeasured terms the empiricism and polypharmacy of that period. In place of the complicated formulæ of this era, he used barley-water, oil, and cuppings. He was well aware of the fact that the same agents produce diverse effects on different persons; in fact, he had a wholesome idea of the uncertainty of medicine, and hence followed a conservative course.

Among his anatomical observations one of the most interesting was the discovery of the lacteals, which he described more minutely than Herophilus had done, who also saw them. He saw the vessels of the mesentery were occasionally, but not always, filled with milk, or a white fluid resembling it. It is said that he found these white vessels both in man and in the brutes.

If, in his medical practice, he exhibited a degree of timidity, he certainly showed sufficient boldness and decision in surgery. In schirrhosities and tumors of the liver he did not hesitate to make a free opening to the part and apply remedies directly to this organ, and did the same in cases of splenic disease. He regarded both the liver and spleen as unimportant parts in the animal organism. He objected to the extraction of teeth when much force was required, and wholly disapproved of tapping in dropsy. In cases of retention of urine he made use of a catheter, in form like the Roman letter S, of which he was himself the inventor, and which long bore his name. I believe the first reference we have in ancient literature to the catheter is in connection with Erasistratus, and that he is considered its first inventor. Erasistratus did not regard the pulse to be of as much importance as Herophilus maintained. He was the first who had a correct idea of the use of the trachea; and disproved the error which had so long been a question in dispute among the ancients, and which was believed in by Plato, concerning the passage of fluids, taken into the mouth, entering the trachea and thence into the lungs. He settled the matter conclusively that its function is solely that of an air tube, and that the lungs are pneumatic organs. He is the originator of the name *trachea*, which has continued in use to the present time, and will probably never be superseded by any other term.

Imperfect and fragmentary as are our sources of information concerning the two subjects of the present sketch, nevertheless they are sufficient to enable us to obtain an important insight into the state of anatomical and physiological knowledge existing among the ancients twenty-two centuries ago. We also learn somewhat of their pathological and therapeutical notions, as well as of their surgical ideas, instruments, and operations. Thus we have been enabled to see that enlightened and original ideas concerning the structure and functions of the human body in health, and many practical methods of treating the diseases and injuries to which it is liable, were known to the physicians and surgeons of the Alexandrian School of Medicine three centuries prior to the birth of Christ.

The materials for this sketch were obtained from the following: *Thompson;* Art 'Anatomy,' *Encyclop. Britt.*, ninth ed. *Marx; De Herophili Celeberrimi Medici Vita, etc.*, Gott., 1840, 4°, review of, in *Brit. and For. Med. Rev.*, v. XV., 1843, pp. 106–114. Articles "*Herophilus*" and "*Erasistratus*," in *Smith's Dict. of Greek and Roman Biog. and Mythol.*, Lond., 1873, and in *Anthon's Classical Dict.*, N. Y., 1865. *Portal; Hist. de l'anat. et de la chir.*, Paris, 1770. *Jourdan; Dict. des sciences med.: Biographie medicale*, Paris, 1821. *Moir; Outlines of the Ancient Hist. of Med.*, Ed. and Lond., 1831. *Dunglison; Hist. of Med.*, Phila., 1872. *Hamilton; Hist. of Med., Surg. and Anat.*, Lond., 1831. *Renouard; Hist. of Med.*, Cincinnati, 1856. *Watson; The Med. Profes. in Ancient Times*, N. Y., 1856. (See also *Haller; Biblioth. Anat.* and *Biblioth. Medic. Pract.* *Sprengel; Hist. de la Med.*).

# EDITORIAL DEPARTMENT.

## ANATOMICAL ILLUSTRATIONS.[1]

It is very trite to say that the needed familiarity with the human frame is to be obtained only by constant and repeated and continued inspection, study and association with its component parts, until their natures, their positions and relations become ground into the very fibre of one's consciousness ; but this truth is quite as important as it is trite, and quite as systematically disregarded as it is important and trite. Whenever the merits of a book of anatomical illustrations are to be considered, the test that is to try it is to be found in this truth. The true relation of illustrations to anatomical study is that of a chart which marks out the way to be traversed, or shows a path that has already been gone over. It is in what an illustration suggests, teaches, the working power that it gives, that its value lies, so that, with regard to positive worth, a rude diagram quite often may be of more value than the most elaborate and faithful engraving.

In Great Britain the difficulty of procuring anatomical material has been the spur which has prompted to the multiplication and elaboration of books of plates, of casts and models, and of permanent preparations. By reason of this difficulty, much of anatomical study there has to be carried on with these substitutes. On the Continent, the wealth of material, which is found in all its schools, has enabled its anatomists to study the structures of the body in so many new relations, and to pursue such new and more perfect methods in their demonstration, that in the need of depiction for satisfactorily preserving the results of their work, an unexampled impetus to the production of profusely illustrated books has been given. Since Vesalius, living in the intimacy of Titian, borrowed the pencil of his favorite pupil, Jean de Calcar, to execute his wonderful plates, art has not ceased to be an invaluable hand-maid of anatomical science. The monuments that commemorate the names of Eustachius, of Bidloo, of Cowper, of Albinus, of Sandifort, of Wm. Hunter, of Mascagni, and of Cruveilheir—and these are but the beginning of a long list—are the offspring of this union and the glories of the literature of anatomy. The experience of the present is that to a greater degree than ever has the union of description and depiction become necessary, in chronicling the facts of anatomy, and those works are the most sought after, and of the greatest value, which the most intimately combine the two features: Hyrtl's Handbuch der topographischen Anatomie, in point of usefulness, therefore, yields to the Traité d' Anatomie topographique of Tillaux. The sharpness of outline, the fullness of detail, the legibility and convenient placing of the names of parts, and the multitude of engravings have made Gray the universal text-book in this country, quite independently of the character of the descriptive text. From the point of view of the student beginning the study of anatomy, all engravings are diagrammatic, and quite as much as the most elaborate and faithful need the accompaniment of demonstration from the subject. In the examination of the subject, in turn, the delineation may often take the place of a demonstrator in teaching what for, and how to search, while to supplement and correct all the textual description is added. The value of engravings as helps in the study of the body, therefore, cannot be over-estimated ; yet, in too many instances they are diverted from their proper use and set to do a duty which it is impossible for them to accomplish. The student who, when beginning his medical studies, has placed in his hands an illustrated work on anatomy, and is bidden to study, the pictures therein being assumed by his preceptor to render unnecessary the presence of bone or dissection till he is well advanced in the curriculum, finds, as time passes, that bewilderment of mind and complete failure to derive any practical benefit from the hours thus spent is the uniform result. The wrong bent given to his work at the beginning proves a serious handicap upon him in the after race for professional advancement. The opportunities which the writer has possessed to observe the methods of study adopted by students have shown him that in far too many instances the great mass of the study done in anatomy is a study of pictures and a memorization of set descriptions. It is possible for a man to graduate with honor from our best schools, and yet to have never had any more intimate knowledge of the bones of the body than that which he has gained from viewing them afar in the hands of a lecturer, or through a glass darkly in the cases of a museum, while in addition he may boast that all his dissections have been made by proxy. Whenever, therefore, a volume of anatomical plates is announced, the question may be very justly propounded as to whether its work is to be that of fostering superficiality of study, and of affording a broken reed for the future practitioner to rest upon, or whether it promises to occupy its proper sphere, in supplementing demonstration and description, by giving direction and permanency to the results of both.

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[1] Anatomical Plates, arranged as a companion volume for *The Essentials of Anatomy*, and for all works upon Descriptive Anatomy, comprising four hundred and thirty-nine designs on steel, by Prof. J. N. Masse, of Paris, and numerous diagrammatic cuts selected or designed by the editor, together with explanatory letter press. Edited by Ambrose L. Ranney, A.M., M. D. New York: G. P. Putnam's Sons. Brooklyn: F. B. O'Connor.

The new edition of Masse's anatomical plates, which is now offered to the profession by the Messrs. Putnam, under the editorship of Prof. Ranney, fulfills the promise of its editor in respect of the convenience for use which its shape and volume give to it. The general accuracy and clearness of the plates were abundantly testified to when they were first introduced to the profession in this country, in 1845, by the late Prof. Granville Sharp Pattison. The work of the present editor has been the addition of some twenty-nine diagrammatic figures, mostly illustrations of points in the course and distribution of vessels and nerves. These constitute a valuable addition to the volume. When, however, this atlas is measured by the principles above considered with reference to all anatomical illustration, it is evident that the anticipations as to its usefulness, both of its author and editor, cannot be realized. In its present form it is intended to be a companion volume to the "Essentials of Anatomy," by Drs. Darling and Ranney, but this it can be only in name. Even were the text of the "Essentials" written with a view to its illustration by these plates, their divorcement from each other into separate volumes would be fatal to their mutual helpfulness. Even the old method, now happily less frequently adopted, of massing illustrations at the end of a volume is very inconvenient and objectionable to every one but the binders, for whose pleasure the method seems to have been devised. The atlas, therefore, must stand by itself to be judged. We have expressed our opinion as to the little use such illustrations are to the unaided student. To the physician who desires to refresh his memory as to anatomical relations, by a glance at a picture, they may be of more value; but here the very features of the atlas, its small size and portability, which commend it to the good will of the student, detract from its value to the practitioner. The small size of the figures has rendered necessary the use of reference figures for identifying the parts represented. We cannot agree with the editor that this is not a disadvantage, and should take exception strongly to his emphasized assertion of the importance of the study of plates made in connection with his reference to the use of these reference figures, which he thinks will necessitate more careful study of the plates themselves in the effort to understand them. On the contrary, we think that whatever hinders the immediate identification of a representation with the description, oral or written, or vaguely existing in the memory, of the structure which it is intended to depict, is a great disadvantage. As to the study of plates, whoever is to depend for his anatomical knowledge on such a source had better desist from the pursuit altogether.

The most serious criticism that we have to make on this atlas is that it is a reprint of a foreign author. American anatomical literature is yet to be created. The first century of our history as a nation has nothing more to show in this department than the works of Wistar and Horner, both entirely unknown to the present generation. What worthy fruit have the labors and abilities of the anatomists of this country now living to display? In our translations and reprints of foreign authors we continue to exhibit a dependence upon the mental products of other lands that little agrees with our frequent boasts of independence and superiority. The reproach of forty years ago as to general literature, "who reads an American book," still applies to anatomical literature, for there is none to be read. To the authors of the "Essentials of Anatomy," and to the able editor of this volume of plates, we know belong the ability and the opportunity to make themselves the leaders in the reform we invoke. Their lives devoted to this field of study, unlimited material upon which to draw for original investigation, all the resources of the metropolis at their command, we may well expect from them a work which to this country shall be what those of Hyrtl or Henle, Sappey or Tillaux, Quain, Gray, Holden or Humphrey are to their respective countries. L. S. PILCHER.

## VAN BUREN ON THE RECTUM.[1]

This, the second edition of Prof. Van Buren's work upon diseases of the rectum is well worthy a renewal of the favor with which the first edition was received. It was our inestimable privilege to listen to these lectures as they were delivered originally to the class twelve years ago; and it seems, as one reads, as if every page was stamped with the genial and expressive face of the veteran teacher, so thoroughly in keeping is the manner and style of the writing with the easy and natural method of delivery. The author has largely rewritten the book and introduced, as stated in the preface, " new matter, mainly in the shape of opinions and cases, from authentic sources which his own experience has led him to select for their value in illustrating the present state of our knowledge." The result is that the work has grown to a royal octavo volume of over four hundred pages.

Our author, in a series of twelve lectures, deals in an exceedingly practical manner with the commonly-met-with as well as the rarer and more serious affections of the rectum and lower bowel. Beginning with pruritus ani, he takes up, in about the order of the frequency of their occurrence, the diseases affecting these parts; carrying the reader successively through the consideration and study of internal hæmorrhoids, prolapsus ani, polypus and benign tumors, abscess, fistula in ano, fissure or irritable ulcer of the anus, ulcer of the rectum, benign stricture of the rectum, and cancer of the rectum, he ends by devoting a chapter to congenital malformations, fæcal impaction, foreign bodies, atony of the rectum, neuralgia of the anus and rectum, diagnosis and exploration and the hygiene of the lower bowel. In a systematic treatise, which in most respects this work has every right to claim to be, representing, as it does, about all that is best known and most favorably received concerning the subjects of which it treats, a more natural division of the subject would have been followed from changing the plan of the original work and placing the section upon diagnosis, means of exploration, etc., in the opening chapter. In fact, the whole of the last lecture, including the remarks upon the hygiene of the lower bowel, may be read with great profit preliminarily to the perusal of the rest of the book.

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[1] Lectures upon Diseases of the Rectum and the Surgery of the Lower Bowel, delivered at the Bellevue Hospital Medical College, by W. H. Van Buren, M.D., LL.D., Professor of the Principles and Practice of Surgery in the Bellevue Hospital Medical College, New York. D. Appleton & Co., 1881.

No better commentary upon the lack of realization of the importance of rectal exploration could be offered than the simple calling attention to the frequency with which surgeons are consulted by patients who have gone through a routine treatment for months by means of cream of tartar and sulphur, and an ointment of galls, in whom not the slightest attempt at a physical examination, beyond a simple inspection of the external parts, had been attempted. It, therefore, not unfrequently happens that fistula, ulceration, and even malignant disease, is very often treated for piles, much to the patient's detriment always, and, occasionally, as in the latter case, involving a loss of time and opportunity valuable to the saving of life itself. Doubtless, this neglect is in a great measure due to the natural difficulties in the way of a thorough exploration of the rectum ; especially that obstacle, of all others most difficult to overcome, the ever-watchful sentinelship of the sphincter ani muscles. But, the fact that Prof. Van Buren has practiced overstretching and temporary paralyzation of these muscles a great many times during the past twenty years without the slightest inconvenience resulting, and when is added to the advantage thus gained the blessings of anesthesia, particularly the safe and temporary unconsciousness easily produced by nitrous oxide, there can be no excuse for a neglect to differentiate, in ordinary cases, between piles, fistula, ulcer and malignant disease. Without these aids a satisfactory diagnosis cannot be made ; with them little else is needed, other than the eyes and fingers of a surgeon, and a patient.

Our author, after reviewing the various methods in vogue for the radical cure of internal hæmorrhoids, gives his preference, in most unqualified terms, to the operation by the ligature. He considers, as essential features to his method of operating, the production of full anesthesia and an overstretching of the sphincters, so as to secure ready access to the parts. In addition to this, he has modified a suggestion made by the late Mr. Salomon, of St. Mark's Hospital, London, of incising the tissues at the base of hæmorrhoids before applying the ligature. Prof. Van Buren only considers it needful to divide the muco-cutaneous covering around the outer half of the base of the tumor, claiming that this is sufficient to prevent the after pain which strangulation of this part causes. After tying the ligatures tightly, he snips off with curved scissors the greater portion of the strangulated tumor beyond the ligature. An exceedingly useful modification of the operation by ligature has been introduced by Prof. A. J. C. Skene, of this city. He first draws down, or if an anesthetic is not used, the patient bears down and extrudes, the hæmorrhoids. The base of the tumor is then rapidly constricted by means of a clamp, which is simply a large sized Fleet Spier's artery-constrictor; the ligature is then applied only sufficiently tight to maintain the strangulation which the clamp has produced. After injecting the tumor with a solution of carbolic acid in several places, he returns it *en masse* into the rectum. Prof. Skene assures us that he has operated in this way at his office without an anesthetic, and that patients suffer so little inconvenience after the operation as to be able to walk home in comparative comfort. This combination of the clamp and ligature, with its special features of antiseptic treatment of the strangulated mass, is worthy an extended trial. That Prof. Van Buren is not alone in his estimate of the almost absolute safety of the operation by ligature is evident from a remark made by Allingham. This surgeon, in a recent edition of his almost classic work upon diseases of the rectum, asserts that he does not think in the whole range of surgery there is any procedure worthy of the name of operation which can show a greater amount of success or smaller death rate than the ligature of internal hæmorrhoids.

In speaking of prolapsus ani, our author divides the affection into the partial and complete variety, and forcibly insists upon the great practical importance of making an accurate differential diagnosis between the two. Operations upon the former assume a minor importance from the fact that it involves the mucous membrane alone; with the latter, however, it is far different, and the difficulty of determining in a given case, whether or not all of the coats of the rectum are present, is often very great. A more natural division of the subject is that of Allingham, who denominates the variety in which the lower part of the rectum, including the mucous membrane and sub-mucous tissue are turned out of the anus, as prolapsus; while the descent of the upper part of the rectum in its whole thickness, or all of its coats, through the anus he calls procidentia recti. In view of the fact that, contrary to the usually accepted belief, Van Buren asserts that in his experience, complete prolapse is the rule rather than the exception, the selection of suitable cases for operation, and the choice of operative procedure become vital questions. He gives decided preference to the operation by actual cautery applied in such a manner as to produce vertical strips of eschar; considering that the risk of subsequent stricture of the gut is too great to admit of its application in any other way. The treatment by the free use of nitric acid applied over the whole surface of the prolapsed portion above the anal margin, he condemns for the same reason. There may be some doubt fairly expressed as to the ground for fear in the latter case: the procedure has received the sanction of the highest authority; it seldom fails if properly carried out, and results in a complete and permanent cure, particularly in children. The manner of its application, however, is of great moment; it should be applied with sufficient freedom to cause considerable inflammatory reaction and subsequent plastic exudation, but a slough should never be produced by its use. He does not object to its use, however, in the same manner as that recommended for the actual cautery in longitudinal and vertical strips. His warning against the performance of any operation for the entire removal of a complete prolapse is well timed. The suggestion as to the propriety of explorative laparotomy in an extensive prolapse, with evidences of invagination, in these days of bold abdominal surgery and antiseptic advantages, is more than likely to be followed.

A not unimportant added feature of this edition is the judicious introduction of wood cuts to illustrate the text. Of especial importance is this addition in those portions of the work in which the differential diagnosis of rectal neoplasms is considered from a histological standpoint.

In the matter of the co-existence of fistula in ano and phthisis the question of operative interference is yet a debatable one. Our author takes the only sensible and tenable ground upon this point when he says: "there is no reliable evidence that the suppression of an habitual discharge can do harm in these cases; on the contrary, it is pretty certainly a positive advantage to arrest it; and I would advise the attempt to cure a fistula in a patient with physical signs of phthisis, provided there were no positively advancing softening or severe cough, because, in addition to stopping a waste, it would remove an impediment to exercise in the open air." As to the methods of operating, he gives the first place to the knife, of course, and dismisses in a few sentences the method of cure by the elastic ligature as introduced by Dittel, of Vienna; and speaks with deserved disparagement of the tentative and timid procedures by injections, the common ligature, etc. He advocates the Paquelin thermocautery for cases in which excessive hæmorrhage is be feared, yet no mention is made of the advantages of the galvano-cautery écraseur in the same class of cases. In our hands this instrument has given the most satisfactory results where free division is necessary in cases of high internal opening and an external opening, comparatively remote from the anal margin.

In the lecture upon cancer he takes occasion, incidentally, to criticize sharply the too general application of the adjective "*scirrhous*," suggesting as it does, in addition to its meaning of density or hardness, the idea, to most minds, of cancer. He prefers, instead of the substantive "scirrhus," to designate the hard variety of cancer as "carcinoma." The epithelial variety of the disease is considered to be the most favorable for operative interference; and some suspicion and doubt are expressed as to the correctness of the diagnosis in many cases of reputed cure by excision; yet no discredit is intended to be cast upon the operation by this; on the contrary, even in adenoma, when in a condition at all liable to be mistaken for cancer, and which, with its tendency to merge into malignant disease, offers a sufficiently good case for the operation, it would be judicious surgery to give the patient the benefit of the doubt. GEORGE R. FOWLER.

## GENITAL IRRITATION—AGAIN.

*To the Editor of the Annals of Anatomy and Surgery:*

Dr. Shaffer's (editorial) remarks on my communication on "Genital Irritation" call for only brief reply. To argue that a condition does not exist because *he* has not seen it, is an assumption which it is safe to predict the profession will not assent to. It would have been safer to have assumed that I could not have reported a case without having first carefully investigated its history. There was no evidence that the Bamberg child had ever had diphtheria; or, if it had, that there was any sequence of a constitutional nature, or of the loss of muscular power, which could be referred to any antecedent affection. On the contrary, the accession, progress, culmination of and recovery from the so-called paralysis were essentially different from what we see in "diphtheritic paralysis." In reference thereto, Dr. Fruitnight's letter seems to set the matter at rest, and to make it necessary to adopt some other explanation than that it was the effects of a disease which there is no evidence that the child had ever had.

The aim of my communication was to extend the inquiry into a broader field than the special effects which it is believed, by a majority of those who have studied the subject, that phimosis may produce under certain circumstances. And I would continue to call the attention of careful observers to the various forms of "genital irritation" which the civilized woman is especially subject to, to the end that the world may profit by more carefully observed facts and better elaborated deductions.

C. FAYETTE TAYLOR.

259 WEST FIFTY-FOURTH STREET, NEW YORK, July 5, 1881.

*My Dear Doctor:*

In my communication to you, I stated that I first saw the boy in July of last year. When I made that statement, I had reference to the loss of muscular power of the patient. The truth is, however, that I was the attendant at the time of the birth of the child, and have also treated him for every attack of illness which has occurred to him from that time until the present. Moreover, I can unqualifiedly and most positively state that the boy never had an attack of genuine specific diphtheria prior to the appearance of impaired muscular power. What he did have a month or so before the symptoms of paralysis showed themselves, was a characteristic attack of sore throat, in which the tonsils were implicated and were covered with a pultaceous layer, hence a follicular tonsillitis. This attack had not the slightest appearance of diphtheritic disease. But, as is well known to us, the laity are apt to consider *all* whitish appearances of the throat, whether benign in character or not, as diphtheritic, hence the statement of the father to Dr. Simpson, that the child had had diphtheria can be thus explained.

As is usually the case, this form of tonsillitis has recurred several times in the person of our patient. Once, however, but *after* the performance of the operation, the child suffered from a very slight attack of diphtheria, which was not followed by any loss of muscular power whatever.

Very truly yours, J. H. FRUITNIGHT, M. D.

TO DR. C. FAYETTE TAYLOR.

# THE CLINIC.

## PENETRATING WOUNDS OF THE ABDOMEN.

### REPORTED BY JOHN C. SCHAPPS, M. D.

During the six months ending October 1, 1880, the following five cases were admitted to St. Vincent's Hospital, New York. In all, excepting the last, which was received in a dying condition, was the familiar routine treatment of morphine and strict avoidance of irritation of the peritoneum adopted. The course followed was to commence immediately the administration of morphine, and to continue its use in as large amount as could be safely borne until danger of peritonitis had passed. It will be noticed that, in some cases, the amount used was very great. In fact, the only limit recognized was determined by a careful supervision of the pulse and respiration. A liquid diet, and the use of stimulants, generally in proportion to that of the opiate, were maintained.

CASE 1. Service of DR. CHAS. PHELPS. Male, æt. 25, admitted April 13, 1880, having been stabbed in the abdomen. A penetrating incised wound about three-quarters of an inch long is found two and a half inches above symphysis pubis. A knuckle of omentum, size of a walnut, protruding (not covered by parietal layer of peritoneum). Bladder not perforated. General condition good. Treatment: Carbolic spray, and usual antiseptic precautions used. Omentum cleansed and returned. A single silver suture inserted, not including the peritoneum, and the Lister dressing applied. Morph. sulph. ¼ gr. every two hours, the dose being varied p. r. n. Temperature did not rise above 101⅛°, and only slight local tenderness existed. April 25 (9 days), discharged. Cured.

CASE 2. Service of DR. CHAS. PHELPS. Male, æt. 18, admitted May 8, 1880. The previous afternoon was stabbed in the abdomen, and during the remainder of the day was walking around the city. Is found to have a penetrating incised wound one-third of an inch long, in a transverse direction, one inch above umbilicus. A mass of omentum three inches long, much congested and tightly constricted by the edges of the wound, protrudes (not covered by parietal peritoneum). General condition fair.

Treatment: Wound slightly enlarged, and omentum returned. Silver sutures, not including peritoneum. Lister's method used. Morph. sulph. ¼ gr. every hour, varied p. r. n. Moderate amount of circumscribed peritonitis. May 11 (3d day). P. 92, R. 26. T. 103°, morphine increased to ⅙ gr. every hour, with good effect. May 17 (9th day). had sudden exacerbation, P. 126, R. 26, T. 105°, morphine increased to ¼ gr. every hour, and so continued for three days, the respirations not falling below 18. then gradually diminished. May 31 (23d day), discharged. Cured.

CASE 3. Service of DR. CHAS. PHELPS. Male, æt. 29, admitted May 19, 1880, having been stabbed in the abdomen. Has an incised wound penetrating the abdominal wall one inch in length, below and to the left of ensiform appendix. Considerable hæmorrhage from small vessels in wound. Treatment: Carbolic spray, wound cleansed with carbolic acid, and dressed (filled) with absorbent carbolized jute, and Lister's gauze. Morph. sulph. ⅙ gr. every two hours, varied p. r. n. Slight local tenderness. Temperature did not rise above 100⅜° ; wound closed by granulation, and on June 13 (25th day), he was discharged at his own request, a slight superficial portion remaining uncicatrized.

CASE 4. Service of DR. CHAS. PHELPS. Male, æt. 20, admitted May 26, 1880, having been shot by pistol at distance of three feet. Size of bullet unknown. On admission, has bullet wound penetrating abdominal wall two and a half inches above and to the left of the umbilicus. General condition fair. Within half hour experienced great depression of vital powers, and vomited considerable blood. Treatment: Small frequent doses of iced stimulants, morphine hypodermically and by mouth. Patient gradually rallied. May 27, P. 86, R. 30, T. 102°. Ordered morph. sulph. gr. ⅛ every hour, increased on the following day to gr. ¼ every hour. This was continued till June 1 (5th day), then gradually reduced and stopped on June 11 (16th day). The respiration had ranged from 30 to 18, the temperature from 103⅜° to 99°. An enema was administered daily for three days without effect till June 14th, nineteen days after the injury, when the bowels moved for the first time. The location of the bullet was never ascertained. June 17th (22d day), discharged. Cured.

CASE 5. Service of Dr. J. L. LITTLE. Male, æt. 30, admitted August 16th, having shot himself. Is found to have a bullet wound penetrating the anterior abdominal wall one and a half inches to left of median line and one inch below free border of ribs. The wound of exit was three inches from median line of back, and on a level with ninth rib. Patient is in a state of collapse ; has hæmatemesis, hæmoptysis, and considerable bleeding from wounds. Treatment: Ice, stimulants and morphine. Wounds dressed with carbolized jute. Died ten hours after admission. Autopsy showed that the projectile had penetrated the stomach, left lobe of liver—of which a small mass was completely separated—diaphragm, lung and ninth rib.

# ON INGUINAL TESTICLE, AND ITS OPERATIVE TREATMENT BY TRANSPLANTATION INTO THE SCROTUM.

By PROFESSOR DR. MAX SCHÜLLER,

OF GREIFSWALD, GERMANY,

DOCENT DER CHIRURGIE IN THE UNIVERSITY OF GREIFSWALD.

AS we know from embryological investigations, the testicle is found originally in the abdominal cavity below the kidney. It descends gradually, however, during the fœtal development, apparently in consequence mainly of the traction of the so-called Hunter's guiding ligament (*Gubernaculum Hunteri*). This latter is a muscular elastic string arising from the lower posterior surface of the testicle and the epididymis, and branching off into three ends, one of which inserts itself at Poupart's ligament, the other on the anterior surface of the pubic arch, and the third, the longest, passes through the inguinal canal and takes root at the bottom of the scrotum. Under the influence of this striped muscle the "*descensus testiculi*" takes place within the fœtal period. During the seventh month the testicle is situated behind the inguinal ring; during the eighth month the testicle commences to pass through the inguinal canal; with the ninth month the external inguinal ring has been passed, and after birth the testicle is found in the scrotum.

This normal *descensus testiculi* may become interrupted or retarded by several influences, some of which are not yet known, and then the anatomical relations of the testicle to the peritoneum and to the sheaths which form around the testicle itself and around the spermatic cord must necessarily differ from the normal. If the testicle has remained high up in the abdominal cavity (abdominal testicle), we find it behind the peritoneum, enveloped by this membrane like the kidney, often so extensively that a mesorchium, which in some respects may be compared with the mesenterium, presents itself. The inguinal canal is empty, the corresponding half of the scrotum imperfectly developed. Such a condition generally is not lasting; usually at a later period the testicle descends further; this retarded descent, however, is seldom a complete one. As a rule, the retained testicle descends somewhat at the age of puberty, in some exceptional cases even later. The abdominal testicle is not seldom preceded by a peritoneal pouch reaching down into the inguinal canal. This pouch, to all appearances, consists in an independent development of the so-called Seiler's cœcum—that is, the extreme lower end of the *processus vaginalis peritonei.* This peritoneal pouch may facilitate the entrance of the testicle, and at the same time may be followed by formation of hernia. The testicle when located in the inguinal canal at birth (inguinal testicle), and remaining there, may give rise to symptoms at a rather early period. It temporarily swells, especially at the period of puberty, becomes painful, or descends further in the inguinal canal, leaving this canal at times and returning again at other times. In such cases we always find alongside of the testicle a more or less deep sac-shaped peritoneal pouch, the *tunica vaginalis*, into the branch of which the testicle and the epididymis are entered; the spermatic cord, remaining outside of this sac, is attached to the outer surface of the tunica-vaginalis-canal. Around this and the spermatic cord is further drawn a fibrous and a muscular layer. While the fibrous layer is given off exclusively from the walls of the inguinal canal, it appears that the muscular layer (cremaster) originates partly from the muscular *gubernaculum Hunteri.* It is at least not unlikely that with the descent of the testicle both lateral ends, or bellies, of the gubernaculum, which insert themselves at Poupart's ligament and at the pubic arch respectively, attach themselves loop-like to the sides of the testicle and the spermatic cord, and, together with the muscular fibres originating from the oblique and transverse muscles of the abdomen, enter into the formation of the muscular hollow cylinder, the cremaster, which surrounds the testicle and spermatic cord. According to others, these ends, or bellies (the lateral ones), do not really belong to the gubernaculum, but are derived from the internal oblique and transverse muscles of the abdomen. At former anatomical examinations of fœtuses of different ages, however, I had opportunity to convince myself that they really belong to the gubernaculum. As we know from experience, the inguinal testicle possesses great mobility, it protrudes easily from the inguinal canal under the integument in front of the external abdominal ring, and likewise returns easily, not only into the inguinal canal, but also into the abdominal cavity. I am inclined to suppose that it is just the muscular layer spoken of which, by occasionally contracting, causes the frequent return into the abdominal cavity. This may, perhaps, be favored also by complete absence of the middle end of the gubernaculum. If this end is altogether unattached, the testicle necessarily not only does not enter the scrotum, but at the same time its return into the abdominal cavity must be facilitated. Under such circumstances it may sometimes be the case that the tunica-vaginalis-canal, together with the testicle, has been drawn upward, and at the same time has become inverted like the finger of a glove. But I believe that, as a rule, it, together with the testicle, is drawn back into a pocket of cellular tissue, formed before the internal aperture of the inguinal canal by downward pressure of the peritoneum of the pelvic abdominal wall. So at least I found it in a case which I shall describe further down. Then the tunica-vaginalis-canal, drawn back together with the testicle, forms a sac situated in front of the peritoneum, into which —on account of its permanent communication with the abdominal cavity—occasionally a hernia may enter. It is possible that the testicle may return without the entire tunica-vaginalis-canal following, namely in those cases in which a sac-shaped pouch of the latter, below the testicle situated in the inguinal canal, reaches down into the scrotum. Under such conditions the testicle may return into the inguinal canal, not only when hanging within a mesorchium in the tunica-vaginalis-canal, and therefore possessed with more than normal mobility, but also when drawn back together with the nearest part of the tunica vaginalis only. There remains then in the scrotum below the inguinal ring a sac-like pouch of the tunica vaginalis, even when the testicle has completely returned into the inguinal canal; within this pouch, alongside of the testicle placed somewhat higher, we may find sometimes the spermatic cord hanging down in the shape of a downward directed loop. Only recently I had an opportunity to observe this state of things in a patient after reposition of an inguinal testicle into the abdominal cavity. In such cases sometimes we find also a portion of intestine or omentum in the open tunica-vaginalis-canal. This may, passing the testicle, enter into that part of the tunica-vaginalis-sac which extends lower down, and located there, it appears that it may prevent the descent of the testicle further down into the scrotum. More frequently then in this form we observe hernia behind the testicle, intestine or omentum having entered behind the testicle into the open tunica-vaginalis-canal.

These frequent complications of the inguinal testicle with hernia have, perhaps, as often been the cause of error in diagnosis between inguinal testicle and hernia, as the location, the mobility and other symptoms of inguinal testicle, but the true state can be very easily discovered by careful examination of the scrotum and the inguinal region. The corresponding half of the scrotum is empty. The scrotum surrounds only one testicle, grasping it pretty tightly. The inguinal testicle forms in the inguinal region a roundish-oval, more soft than hard swelling, with several strings of vessels which are continued upward. As a rule, it has been arrested in its development, is small and of infantile condition, though it may not always remain in the low state of development corresponding with the fœtal period at which the development was interrupted. The epididymis and the the spermatic cord, however, are developed to their normal size and these formations appear, in consequence of the smallness of the testicle, generally of unusually large and massive development. The small inguinal testicle reacts upon pressure as lively as a testicle of normal development, indeed, I have not seldom observed a much greater tenderness of the same. This tenderness is very characteristic, and distinguishes the inguinal testicle very well from an omental hernia, which would be the thing most liable to be confounded with it. In my opinion, a hernia co-existing with the inguinal testicle may render the diagnosis somewhat more difficult only in such cases in which the hernia, after having passed the inguinal testicle, has entered deeper down into the tunica-vaginalis-sac. But, after reduction of the hernia, which, on account of the relatively great width of the canal of the vaginal process, does not generally happen to be difficult, we may soon be able to inform ourselves of the real state of affairs. The absence of the testicle in the corresponding half of the scrotum, the presence of a soft or moderately firm, roundish body, with vascular strings, often coil-like, surrounding it and continuing themselves towards the abdominal cavity, and the characteristic tenderness of this body at the external inguinal ring, or in the inguinal canal, are pathognomonic. If, as it not seldom happens, the inguinal testicle has been pushed out of the inguinal canal by cough or pressure, it is apt to be confounded with omental hernia, but can also easily be distinguished therefrom by the symptoms enumerated. Besides, omental herniæ, do not generally possess the lively mobility which is quite characteristic of the inguinal testicle. If this mobility is lost in consequence of inflammatory processes, the distinction, on the other hand, is facilitated by the swelling, the enlargement and the firmness of the testicle.

All patients with movable testicle retained in the abdominal cavity, or in the inguinal canal, sooner or later experience varying complaints necessitating our interference. Whenever such a testicle, leaving the abdominal cavity, or returning again from the scrotum, enters into or passes through the inguinal canal, it suffers, as a rule, a more or less severe pressure from the firm walls of the inguinal canal, which pressure is always accompanied by a characteristic sensation of pain. This pain, especially while the testicle is pushed through the external or internal aperture, is described sometimes as quite similar to that of concussion of the testicle. These pains of incarceration are the more troublesome, as they repeat themselves most frequently, though not always, with equal severity; in some cases with every violent movement, with stooping down, pressure, running, jumping. As a rule, the sensation of pain soon passes away, but it may become so intense that the patients vomit, faint, etc. This I observed only recently in a case. It is comprehensible that under such circumstances we at first suspect incarcerated hernia, and it is necessary to make the examination the more carefully, because inguinal testicles not seldom are accompanied by herniæ. If we do not at once attempt reduction, but first examine the parts very carefully, we soon will discover the true state. In the case of incarcerated testicle the symptoms readily disappear if the patient is laid horizontally with relaxed abdominal walls and if cold applications are made. Usually, however, there remains an extraordinarily increased tenderness of the testicle in patients with movable inguinal testicle. The slightest touch sometimes is painful.

The frequent incarceration of the inguinal testicle, besides these troubles, gives rise to œdematous or inflammatory swellings of the testicle and the tunica vaginalis, to hydroceles, etc., whereby the complaints are augmented. It is, further, easily comprehensible that accompanying herniæ increase the difficulties of the inguinal testicle by their causing a constant pressure on the same. Occasionally there also may happen incarceration of hernia. Finally, it is a fact established by experience of long standing that testicles interrupted in their normal descent, and especially the movable inguinal testicle, in relatively a great number of cases, become attacked by malignant new formations, by sarcomas and cancers, which fact, according to Cohnheim, we may well bring in connection with the interruption of development and growth of the testicle, which, as stated above already, are accompanying symptoms of the interrupted descent. Cohnheim, as is known, supposes that the retained testicle shows a great inclination to formation of malignant tumefactions because "the existing germs of growth, on account of the retention, have not attained their regular development."[1]

All these difficulties and secondary diseases of the inguinal testicle make remedies and help desirable. In the case of abdominal testicle we may, as a rule, find no cause for interference before it has entered into the inguinal canal—that is, before it has become inguinal testicle. As a general thing, first a truss is recommended, either with the intention of pushing the movable testicle down into the scrotum, or for the purpose of keeping it back in the abdominal cavity. In the latter case, after reposition of the protruding testicle has been made, the truss is to be worn on the external inguinal ring, while in the former we have the pad lying above the testicle, which has been protruded from the external aperture of the inguinal canal, thus to push gradually the testicle downward and to prevent its sliding back. For this end, the application of trusses with fork-shaped pads is thought especially useful. Even if a success has been obtained in some cases by this treatment, we must not expect too much from it. In spite of the best constructed truss, the testicle occasionally will slip back into the inguinal canal, or from this it will glide from under the pad, and it is readily understood that under such circumstances a truss can be not only of no advantage, but must directly do injury by increasing the difficulties of incarceration. In general, I do not believe that the occasional entering of a movable testicle from the abdominal cavity into the inner opening of the inguinal canal can ever be prevented completely by means of a truss. If a hernia protrudes behind or alongside an inguinal testicle, the difficulties of the treatment by truss become still greater, and the results attained by the same very imperfect and unsatisfactory. The trusses with hollow pads, which have been recommended for this complication, are equally inefficacious to prevent the occasional incarcerations of the inguinal testicle. In view of this inadequateness of the treatment by truss in cases of inguinal testicle, I feel justified in recommending instead, for proper cases, *the bloody transplantation of the testicle into the scrotum.*[1] By this operation, however, I do not mean the mere attachment of the testicle in the scrotum by means of suture—a method which might be of only little reliance. I am of the opinion that, above all things, the influence of the cremaster upon the testicle has to be annihilated, and the passage of the inguinal canal obstructed. As is easily to be seen, a reliable and lasting fixation of the testicle in the scrotum, therefore, can only be secured when, in addition to the division of the muscular envelope of the spermatic cord and the tunica vaginalis—after the vessels of the spermatic cord have been isolated—the tunica-vaginalis-canal also, at the orifice of the inguinal canal, and the external opening of the latter itself, have been closed by means of the suture. Only then is it to be expected that the testicle, attached by means of suture, no longer being pulled at, will permanently remain in the scrotum; the sliding back into the inguinal canal is made completely impossible.

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[1] *J. Cohnheim*, Vorlesungen über allgemeine Pathologie. Berlin, 1877. I. Bd., p. 643.

After this plan of operation, I have, in a vigorous lad of 20 years, transplanted, with completely favorable result, a movable right inguinal testicle, which was resisting all treatment by trusses, from the abdominal cavity, whither it had retracted itself at the time, into the corresponding half of the scrotum.

To prepare the patient, a purgative is given the day before the operation, or the intestines are washed out by means of a rectal tube. In the morning, before the operation, the patient should take a warm bath, and the whole pelvic region be most thoroughly soaped and cleansed. The operation is to be made under strictly antiseptic precautions.

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[1] *Kocher* states that *Rosenmerkel* and *Chelius* have already attempted, without success however, the bloody transplantation of the inguinal testicle. I have not been able to find the description of their method.

The method of operation is as follows: If, as in my case, the movable inguinal testicle has slipped back into the abdominal cavity, and the anterior aperture of the inguinal canal is found completely empty, we divide exactly as in incision for hernia, integument and fascia over the external inguinal opening, continue the incision down into the empty half of the scrotum, divide the loose cellular tissue covering the aperture, and pass the fingers through the inguinal canal into the preperitoneal space, in the wall of which the retracted testicle is lying. It is difficult to feel, as it is usually small; it is, however, easily recognizable by the strings of vessels of the spermatic cord, which generally are strongly developed. This mass is hooked with the index finger, drawn against and finally passed through the inguinal canal. Within this mass the testicle is found. It can now easily be felt within its coverings. We next draw a thread-loop through the sac-shaped extreme lower end of these coverings, for the purpose of holding the testicle well outside of the inguinal canal. We then divide in a longitudinal direction, commencing from the inguinal ring, down to near the testicle, the muscular and fibrous coverings in which, as in a sac, the spermatic cord and the testicle are lying, and divide also the tunica vaginalis. After this, follows the isolation and mobilization of the spermatic cord: Carefully avoiding the vessels and nerves of the spermatic cord and vas deferens, we divide, in a horizontal line, somewhat above the testicle, the tunica vaginalis, and likewise the muscular and fibrous coverings of the spermatic cord, and loosen the same a little way, like a ring, from off the spermatic cord; we may even remove a piece of these coverings. As soon as this has been done, the testicle and the spermatic cord, *without the slightest difficulty*, can be drawn as low down as is required. The testicle remains down, and cannot retract itself again. Then follows the fixation of the testicle to the bottom of the scrotum, by means of suture. We fasten it by the application of some cat-gut sutures passing through its posterior and lower surface, in such a manner that it rests on a base as broad as possible; in addition, we pass some lateral sutures from it through the integument of the scrotum, and tie the same outside on the tegumentary surface (mattress sutures) to secure as firm a fixation as possible, of the testicle in its new bed. The next act of the operation is that of the occlusion of the tunica-vaginalis-canal and of the external inguinal ring. We first pass a finger through the open tunica-vaginalis-canal, into the abdominal cavity, and push back any part of intestine or omentum that may protrude. Then an assistant draws the divided tunica vaginalis, just in front of the external inguinal ring, firmly asunder, and by means of an aneurism-needle, we apply a constricting cat-gut suture in such a manner that, beginning at the one cut surface of the tunica vaginalis, we pierce the needle at short intervals of ¼–½ c.m. in and out until we arrive at the other cut surface and the thread has been passed through the whole width of the tunica vaginalis. To effect greater security, there may be applied, in the same manner, a second suture closely below the former. Naturally enough, when the needle is passed in and out care must be taken that it passes through nothing else but the tunica vaginalis, which, however, can be done easily. Now follows a renewed examination of that part of the tunica vaginalis which is open towards the abdominal cavity, while the assistant, by digital pressure from outside upon the inguinal ring, prevents the protrusion of viscera; the thread ends of the constricting suture are tied firmly together, whereby the tunica vaginalis at the point of constriction is drawn together, tobacco-bag like. This suture, which I have often applied in the same manner, after herniotomy, holds very tightly, and cannot slip off. The parts constituting the spermatic cord remain outside of the suture. After this, the pillars of the external inguinal ring are brought together by means of some interrupted cat-gut sutures, either so near, that this opening, which is generally very wide, is closed tightly around the spermatic cord, or only so near that there is room yet for a narrow drainage tube to be placed in the preperitoneal cellular-tissue space. Finally, we insert a drainage tube into the lower part of the tunica-vaginalis-sac as far downward as to the testicle, and close the wound of the integument and the soft parts, by means of silk suture as far as to the point where the ends of the drainage tubes are passed out. Over this is applied Thiersch's salicylized jute, or Lister's gauze-bandage, covering, besides the sexual organs, the whole pelvis, and leaving free only penis and anal opening. For the purpose of preventing soiling of the dressing and to be able to leave the first bandage undisturbed as long as possible, the urine, during the first days, is taken away by means of a soft *Nelaton's* catheter, and an opiate is administered to the patient.

In my case there happened, while there was absolute absence of fever, union by first intention, except at that point at which the drainage tubes were located. A firm cicatrix formed itself. The testicle remained in the scrotum, and, which is most remarkable, *resumed its growth*, which for so long a time had been retarded. At the time the patient was dismissed (four weeks after the operation), it had the size of a large walnut, and was completely painless.

If the testicle is located within the inguinal canal, the method of operation needs no essential modification. If the testicle is located closely before the external inguinal ring, the above described searching for the testicle, it is unnecessary to say, is done away with. We proceed directly to the testicle; otherwise, we operate in the manner described.

This method of operation is equally adaptable to those cases in which the inguinal testicle is accompanied by a hernia. In such cases we shall have to divide first the hernial sac, reduce the contents of the hernia, and then isolate the spermatic cord, transplant the testicle into the scrotum, and further finish the operation in the above described succession.

This operation, in cases complicated by hernia, as well as in those where only difficulties of incarceration of movable inguinal testicle exist, is certainly to be preferred to that of extirpation of the testicle, which latter operation has long been proposed for cases resisting treatment by truss, and which, too, has been performed several times. Our operation preserves the organ, transplants it to that very place which it occupies under normal conditions, prevents the retraction of the testicle, protects it against incarceration and against the diseases caused thereby, and enables us at the same time to keep back accompanying herniæ reliably and permanently.

If it becomes confirmed, by future operations, that the testicle, having been arrested in its development, grows and attains its normal size after its transplantation into the scrotum, as in our case, this fact, as is readily comprehensible, would not only be of theoretical interest, but certainly of practical value also, since, to all appearances, this increase in size depends on the growth of the parenchyma of the testicle. I draw this conclusion from the absolutely normal condition of the testicle of the patient operated on by me. We may, therefore, be allowed to expect that the inguinal testicle by its transplantation may regain, together with its normal size also, its ability of function. If such, however, is the case, it follows by itself that, as long as the inguinal testicle is healthy, castration must not be performed, but transplantation into the scrotum should be resorted to in preference.

Simple inflammatory processes of the inguinal testicle offer no contrary indication to the operation. It may well be performed after the inflammation has subsided.

Perhaps the inclination of retained testicles to the development of malignant new formations is lessened with the resumption of normal growth after the transplantation of such testicles into the scrotum. According to Cohnheim's views, with whom we concur, such, indeed, should be expected; for, after the transplantation, as our case shows, "the existing germs of growth of the testicle may assume *regular* development." Even if we may not have to allow ourselves illusions in this regard, we may, nevertheless, find in these ideas a further inducement to perform the operation.

*Greifswald, July,* 1881.

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# A CASE OF COMPLETE EXTIRPATION OF THE PENIS AND FORMATION OF LABIA MINORA.

By GEORGE R. FOWLER, M. D.,

OF BROOKLYN, N. Y.

JOHN NEWMAN, 58, born in England, a gardener by occupation, came under observation, at my clinic, at the Bushwick and East Brooklyn Dispensary, in April last, with the following history: He was perfectly well up to a year and a half ago, when he noticed a slight swelling about the frenum, painless at first, and occasionally becoming red and looking inflamed; to allay this latter, he was in the habit of making frequent warm applications to the parts. About a year ago, he noticed that the parts surrounding the original swelling had grown harder, and that, when he became somewhat fatigued after a hard day's work, sharp lancinating pains were felt along the inner aspect of the right thigh, in the glans penis and right testicle—pains which were particularly severe at night.

This state of affairs continued until a slight swelling upon the dorsal aspect of the glans occurred. This growth gradually extended until it coalesced with the original swelling upon the frenum. During this latter period, the patient's general health was breaking down. He became very weak and emaciated, and was finally compelled to abandon work altogether. When he came under my observation, I removed a small section of the growth, which, examined microscopically, revealed its nature—that of epithelial cancer. Total extirpation of the organ was offered and accepted as holding out the only prospect of relief.

After several weeks of preliminary tonic treatment, on May 10th, assisted by my colleagues of the dispensary staff, I performed the following operation: The pubic region having been smoothly shaven, and the parts thoroughly disinfected, the patient was etherized. A curved incision was then made through the integument covering the pubic region upon either side of the root of the penis, each beginning in the median line about three-fourths of an inch above the organ; these two joining each other at the peno-scrotal junction. Carrying these incisions through the subcutaneous cellular tissue and dissecting aside the flaps thus formed, the cavernous bodies were brought into view. These were then transfixed by a long steel needle, a similar needle fixing the corpus spongiosum by passing directly across the urethra; thus retraction of the stump was effectually guarded against. The Paquelin thermo-cautery, heated to a cherry red, was then applied to the penis about one-eighth of an inch anteriorly to the needles, and the organ slowly severed. The bleeding from the dorsal artery could not be controlled by the cautery, but it was readily ligatured with cat-gut. No other hæmorrhage occurred. The mouth of the urethra being easily found, the needle transfixing the corpus spongiosum was removed, and a lithotomy staff passed into the bladder. A bistoury was plunged down to the groove in the staff from a point in the perineum about an inch and a half below where the urethra opened into the stump, and, by a bold sweep of the knife directly upwards, the intervening tissues were divided and the urethra laid open. The scrotum was then split in the middle line for an inch and a half further posteriorly. The urethra was detached from the remains of the cavernous bodies, drawn upwards and forwards, and its free extremity stitched to the upper angle of the perineal wound. The lower and posterior angle of the wound which divided the scrotum, and which it will be remembered was an inch and a half posterior to the extremity of the incision which split the urethra, and consequently just that distance removed from what was now the urethral openings, was drawn up and stitched to the posterior extremity of the urethral incision. This left two large masses of redundant scrotal tissue, one upon either side, which were attached by their inner free borders to the edges formed by splitting the urethra. This having been accomplished, what was still left of the sides of the scrotum were united together about an inch and a half above what was now the urethral opening; and thus the two sections formed by dividing the scrotum in two for a portion of its length were, by being united to the edges of the split urethra and to each other above, made to functionate as labia minora or nymphæ, so as to direct the stream of water downwards and forwards away from the patient's body, instead of wetting him in all directions, as usually occurs after this operation. With the nymphæ built up in this way, the patient sits as a woman when urinating, and passing his hand under his thigh draws his scrotum backwards, when the bridge formed by the union of the two halves of the scrotum above the urethral orifice directs the stream in the proper direction.

The parts were kept constantly under the spray throughout the operation. The wound in the pubic region was closed, after removing the needle, by approximating the edges of the integument directly over the charred stump. A Jacques' catheter was passed into the bladder, carbolized putty covering the scrotum; this latter being also found useful in packing around the catheter where it passed through the Listerian materials which completed the dressing. It being found that, owing to the patient's restlessness, it was impossible to keep the Listerian dressings efficiently applied, they were abandoned, and the surrounding parts being kept well covered with carbolized oxide of zinc ointment, several thicknesses of gauze were laid over the wound, and these were kept constantly wetted with a one to one hundred and twenty carbolic solution.

My assistant, Dr. C. D. Beasley, who managed the after treatment of the case, reports that the patient's temperature at no time rose above 101°; this point was reached on the evening of the third day. His surroundings were of the most unpromising character, living as he did in a squatter cabin below the street level, and adjacent to ponds of stagnant water. He had suffered several times during his life from idiopathic erysipelas of a severe character, yet at no time while under treatment did there appear evidences of any local inflammatory action other than that resulting from the operation and necessary to the process of repair. The catheter remained in situ for the first five days, its use thereafter being dispensed with. The cat-gut sutures gave way rather prematurely in some places, and a slight sloughing of the upper portion of the scrotal tissues took place; yet, in spite of these accidents, the purposes of the peculiar features of the operation were in a measure fulfilled. The patient walked about the house on the tenth day, and in a month the healing process was completed. Union by first intention occurred in the pubic portion of the wound and over the stump of the organ.

Prof. Howe, of New York, by a secondary operation, supplied his patient with "nymphæ" some months after an amputation of the penis, by dissecting up the cicatricial tissue, about the orifice of the urethra and uniting it above the same. In my own operation, the object was to make immediate provision for the proper direction of the stream of urine by converting the scrotum into labia minora, at the time of amputation.

# A CASE OF HERNIOTOMY, WITH WOUNDING OF THE OBTURATOR ARTERY. RECOVERY.

By E. H. BARTLEY, M. D.,

OF BROOKLYN, N. Y.

OWING to the peculiarities in the origin of the obturator artery, it is in great danger of being wounded in operations upon femoral hernias. According to Clocquet and Cooper, this artery arises from the epigastric artery in every fourth or fifth man. According to Gray, it occurs in one case in 3½. In these cases it usually arises from the epigastric, near the external iliac, and descends nearly vertically, and lies against the external iliac vein; it then lies on the outer side of the femoral ring. Occasionally, however, it arises farther from the external iliac, and curves inward along the free margin of Gimbernat's ligament; when it is almost sure to be wounded in the operation.

A case of herniotomy, complicated with wounding of this artery, is reported in the *Weiner Medizinische Wochenschrift* for February 5th, 1881, by Dr. Speiczer, which is of sufficient interest to warrant an abstract of its principal features.

The case has a double interest: first, the diagnosis was impossible before the operation; second, the operation was complicated with the accident above mentioned. The patient, a cartman, 38 years old, was a healthy, robust, fleshy man, and when received into the hospital had had the symptoms of strangulation for a little over twenty-four hours. The hernia was of about twelve years' standing, and the patient had worn a truss most of the time since its appearance; but had laid it aside for a time previous to the accident, because it did not completely serve its purpose of keeping the gut in. On a previous occasion, the hernia, which was then about the size of a hen's egg, suddenly gave the symptoms of incarceration, and was reduced by taxis, aided by hot poultices and a hot bath. These means were tried in vain, on this occasion; so that the patient was persuaded, after thirty-eight hours from the beginning of the distressing symptoms, to allow the operation. The tumor at this time, the 3d of September, 1880, was about twelve centimetres long by six wide, extending from the middle of Poupart's ligament towards the scrotum. The patient positively stated, when questioned, that the tumor descended, as it enlarged in size, directly towards the scrotum. The tumor was movable, and gave a tympanitic percussion note. It seemed to diminish in size above, but the thickness of the fatty walls prevented it from being grasped. The size, its position over Poupart's ligament, and the fact that it seemed to extend down towards the scrotum, seemed to indicate an inguinal hernia. On the other hand, it being over the middle part of Poupart's ligament, and the fact that its inner boundary could be fixed by the spine of the pubis, made it probable that it was a femoral hernia.

After being brought under the influence of an anæsthetic, an incision was made over the most prominent portion of the tumor, extending obliquely from above and outward, downward and inward about seven centimetres. A strong antiseptic spray was used during the operation. On opening the sac, a little blood-colored water was poured out, and about thirty centimetres of the intestine was found outside of the ring, which was covered with a little coagulated fibrin. It was dark brown-red in color, and distended with gas. A small piece of the omentum was found drawn down and adherent to the lower part of the sac.

By passing the fingers up to the ring, it entered the crural sheath and determined the diagnosis to be that of femoral hernia. A herniatome was passed into the ring, and several shallow nicks were made in its inner and upper edges by simple pressure upon the knife. This process had to be repeated the third time before reduction was completely accomplished, and the last time a somewhat deeper incision was made downward and inward. When the gut had been entirely returned into the abominal cavity, a little arterial blood was seen to flow out, which, on deeper inspection, after ligation and separation of the protruding omentum, was found to be quite abundant.

It was evident that the obturator artery had been wounded, and an attempt was made to tie it by drawing the walls of the sac asunder by tenacula, and working through the femoral canal and ring. After some delay and useless effort, this opening was temporarily tamponed, and the first incision was extended about five centimetres upward, and the soft parts divided, layer by layer, down to the peritoneum, exposing the great vessels just as in the operation for ligation of the external iliac artery. The bleeding artery was soon tied with cat-gut, as also was a severed vein. The tampon was then removed, and a part of the blood, which had been poured out into the peritoneum, was pressed out by a gentle pressure upon the abdomen. The upper part of the wound was closed by two platinum wire sutures, and, after draining the hernia sac, canal, and wound, the rest of the wound was closed with silk sutures. Antiseptic dressing, compression, etc. The progress of the case was afebrile, and the whole wound down to the drainage opening healed in nine days, with but two dressings. On the twentieth day the patient was discharged, cured, and has remained so to this time—*i. e.*, February, 1881.

The author remarks that, according to the literature of the subject, the danger in this accident is not so much the difficulty of ligating the artery as that it may escape detection, because the blood may be poured out into the peritoneal cavity and thus escape detection. In his case it was only on close inspection, after seeing a few drops of arterial blood, that it was detected.

He, therefore, advises a careful inspection of the parts, after returning the gut, in all cases where much cutting has to be done; for in most of the reported fatal cases the hæmorrhage has not been detected until several hours after the operation, or even at the autopsy.

He thinks the method here used is safer and quicker than that of attempting to tie the artery through the ring.

# ON SOME ANATOMICAL VARIATIONS.

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THE following are some of the more important anomalies observed in the subjects dissected during the session of 1880–'81 in the anatomical rooms of McGill University:

## ABSENCE OF THE LIGAMENTUM TERES.

In a male subject, aged about 40, this ligament was completely absent on both sides. The head of each femur had the usual depression, and the acetabulum of each side was perfectly normal; but no trace of a ligamentum teres either in the acetabulum or on the head of the femur could be made out. The joints were perfectly healthy, and there were no signs of old disease. The anterior part of the capsular ligaments was not abnormally strong, as is sometimes the case when the ligamentum teres is absent. This is the first time that I have seen this abnormality. It is well known that many animals are normally without the ligamentum teres; as, for example, the elephant, seal, tortoise, etc. In the chimpanzee it is generally very rudimentary, or wanting altogether (Humphry). The exact use of the ligament is still a disputed point.

## ABSENCE OF THE POSTERIOR LIGAMENT OF THE KNEE JOINT.

This occurred once, on both sides of an adult female subject. On removing the skin, fascia and popliteal vessels, we came on—first, a little fat, then the posterior crucial ligament covered by synovial membrane. The posterior ligament was entirely absent on both sides. This would be important in abscesses of the ham, as in a case such as this an abscess would most likely rapidly find its way into the knee joint. In excision of the knee, also, it would be well to remember that the posterior ligament is sometimes wanting.

### LIGAMENTUM NUCHÆ PARTLY MUSCULAR.

In a female subject the ligamentum nuchæ was absent at the upper part, its place being taken by strong muscular fibres, which were attached to the external occipital protuberance the whole length of the occipital crest, and the posterior tubercles of the atlas and axis. On the external border of this muscle was a thick, shiny, round tendon continuous below with the ligamentum nuchæ, which was normal from the spine of the third cervical vertebræ. As far as I know, this muscular condition of the ligamentum nuchæ has never before been noticed.

### A VARIETY OF THE STERNO-SCAPULAR MUSCLE (?).

A broad, muscular slip, having a strong tendon along its lower border, was seen in one subject on the right side, arising from the sterno-clavicular articulation and passing outwards above the level of the clavicle to be inserted into the anterior border of the trapezius muscle. In another subject this slip was altogether tendinous, but was attached to the clavicle near its acromial end, and also to the sterno-clavicular articulation. In both subjects the subclavius muscle was normal.

### RECTUS STERNALIS.

This muscle was seen by me for the first time[1] on the left side of a muscular male subject. It arose two inches outside the middle line of the sternum from the aponeurosis of the pectoralis major opposite the fourth intercostal space, and proceeded upwards as a ribbon-shaped muscle half an inch broad and five inches long, to be inserted by a fan-shaped tendon into the aponeurosis of the pectoralis major opposite the second rib. Some of its fibres were continuous with those of the platysma myoides.

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[1] I have careful notes on more than two hundred subjects dissected.

### SUPERNUMERARY DORSAL INTEROSSEOUS.

On the back of the right hand of a male subject a small muscle arose from the base of the metacarpal bone of the ring finger by a narrow tendon, passed diagonally across the metacarpal bone of the middle finger, where it became muscular for about an inch, and then ended in a round tendon which blended with the tendon of the second dorsal interosseous.

### ACCESSORY ABDOMINAL OBLIQUE MUSCLE.[1]

On both sides of a muscular male subject an accessory muscle was found.

On the *right* side it was attached by a tendon to the tip of the twelfth rib, and passed down between the external and internal abdominal oblique muscles to be inserted into the crest of the ilium immediately behind the anterior superior spine. This muscle was about half an inch wide at its origin, and two inches at its insertion.

On the *left* side a somewhat similar muscle existed, but it arose from the lower border of the eleventh rib, also passed between the two oblique muscles, and was inserted with the aponeurosis of the external oblique (with which it blended) into the crest of the ilium about an inch behind the anterior superior spine. The muscle was much the same size as that on the right side. This accessory muscle would probably correspond to the double internal oblique of MacAlister.

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[1] See Guy's Hospital Report, 1871-'72, p. 149.

### ILIACUS MINOR *VEL* ILIO-CAPSULARIS.

This muscle occurred once on the left side; the iliacus divided into two parts, the under being separated from the upper by a cellular interspace. The deeper portion (iliacus minor) arose low down in the iliac fossa, and also from the anterior portion of the capsule of the hip joint, and was inserted into the lesser trochanter, being separated from the superficial portion (iliacus major) by a well marked bursa.

### GASTROCNEMIUS.

This muscle was in one subject on the left side noticed to have a supernumerary head, which arose from the middle of the space on the back part of the femur, formed by the division of the linea aspera. It passed over the popliteal vessels and nerves, and joined the inner head of the muscle just below the tuberosities of the tibia.

### IRREGULAR RENAL ARTERIES.

I have lately several times observed that the renal arteries were double, and sometimes treble, and on one occasion I found five arteries given off from the abdominal aorta and piercing the kidney in various parts. Now, it is important that operating surgeons should be familiar with these various distributions of the renal arteries, especially since nephrectomy has become a recognized operation in surgery and is so frequently performed. During the present summer-session of the Medical Faculty of McGill University, in my course of operative surgery, whilst performing the operation of extirpation of the kidney, we found that there was no artery entering the hilum of the kidney, but that the organ was supplied by two arteries, one of which entered at the extreme upper end, and the other at the extreme lower end. Not expecting this abnormality, the student who was performing the operation, in clearing the kidney from the tissue around it, tore through the artery supplying the upper end. I merely mention this fact to put operators on their guard, and to draw attention to an important point which has hitherto, as far as I am aware, not been noticed.

### PERSISTENT LEFT CARDINAL VEIN.

In a female subject this vein passed up the spinal column as usual and through the diaphragm; but, instead of crossing under the aorta to join the vena azygos major, it continued up the left side of the spinal column and aorta, collecting all the blood from the left intercostal veins, and finally passed over the transverse portion of the arch of the aorta, to join the left vena innominata quite close to its commencement. This vein was of large size, and gave off a small branch of communication, which passed under the aorta and joined the vena azygos major. The left *superior intercostal* vein was normal, and returned the blood from the first two intercostal spaces. No doubt this was an example of persistence of the left cardinal vein. The superior intercostal emptying into the left innominate is peculiar when the left cardinal vein persists.

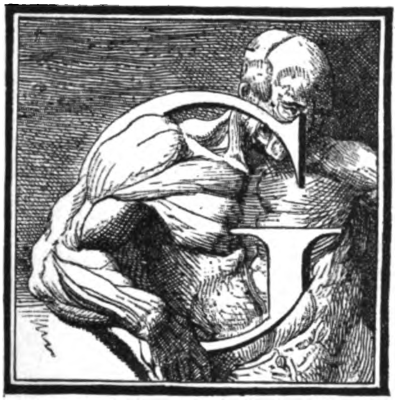
# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

### A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

## XV.—CLAUDIUS GALENUS.

### A. D. 130—200.



GALEN'S voluminous works were the grand and exhaustless repositories of facts, observations, and opinions, to which the entire profession of medicine of the whole civilized world resorted, and on which it placed its unquestioning confidence, and by which it was mainly governed in its practical operations, from age to age, through the long period of fourteen hundred years! An author who could thus sway the opinions of a great profession, and whose works furnished material, argument, and theory for a period of time so vast, must needs have been a man of rare genius, of extensive and accurate observation, and of untiring industry; and, moreover, his works must have fully represented, not merely his own original investigations, but have been a fair exponent of the entire

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science of medicine as understood in the age in which he flourished.

Claudius Galen was born in the ancient city of Pergamus in Mysia, Asia Minor, about the autumn of the one hundred and thirtieth year of the Christian era, and the fifteenth year of the reign of the Emperor Adrian. His father, whose name was Nicon, was a man of wealth, influence and learning, being not only an architect and geometrician, but, as Galen himself in more than one place in his works informs us, was also, in addition to his knowledge of astronomy, grammar, arithmetic, and various other branches of philosophy, a man possessed of patience, justice, benevolence, and other virtues. His mother, however, was a woman of violent temper, scolding and sometimes even biting her maids. Galen, with more frankness than charity, records the degree of domestic infelicity in which his parents dwelt, telling us that his mother quarreled with her husband even "more than Xantippe with Socrates." While very few ancient authors have furnished us with many facts relating to the personal history of Galen, this deficiency is abundantly supplied by his own writings, which abound in personal allusions and anecdotes concerning himself and many of his contemporaries.

Galen's education was thorough, ample, and comprehensive. He received his first instruction from his father. In his fifteenth year (A. D. 144–5) he entered upon the study of logic and philosophy under a pupil of Philopater the Stoic, under Caius the Platonist, under a pupil of Aspasius the Peripatetic, and also under an Epicurean. His father had intended to make of him a philosopher, but changed his mind, in consequence of a dream, and chose for his son the profession of medicine. On what a delicate poise does the destiny of a great genius sometimes hang or turn! Thus a youth who became the most celebrated physician in the whole world—one whose influence in the different branches of medical science has been more extensive and of far longer duration than that of any other individual either in ancient or modern times, had his helm put about, and a new chart, and new sailing directions given to him, in consequence of a whim suggested by a dream! The influence of the dream of Nicon hovered over the genius of medicine during many subsequent ages.

No expense was spared in his medical education. The names of several of his preceptors are preserved, among whom Æschiron, Satyrus, and Stratonicus were of his own country. At the age of twenty he was called to mourn the loss of his devoted father, and it was probably about this period that he went to Smyrna, where he continued his studies under Pelops the physician, and Albinus the Platonic philosopher. He also went to Corinth to attend the lectures of Numesianus, and to Alexandria for those of Heraclianus. He also studied under Ælianus Meccius and Iphicianus. Intent and zealous in the acquisition of the highest degree of culture in his profession, and not satisfied with the powerful assistance of such a corps of instructors as above mentioned, he traveled into other countries the better to witness the practice of men of eminence, to converse with experienced physicians, to observe the peculiarities of natural productions, and the influence of climate upon disease. He tells us that for such ends he visited Cilicia, Phœnicia, Palestine, Scyros, Crete, and Cyprus, Italy and Macedon. He visited Lemnos to examine its celebrated earth, and traveled into Syria to inspect the balsam for which it was renowned. The principal part of his journeys were made on foot, not with a view to economy, for he was possessed of ample means, but that his opportunities for careful observation would be thus increased.

Having in all these ways acquired an extensive and thorough knowledge of the principles and practice of medicine and surgery, he returned to his native city, being now in his twenty-ninth year; and such was the estimation in which he was held in Pergamus, that on his arrival he was immediately appointed by the Pontiff, or high-priest of the city, physician to the school of gladiators—a position which he filled with great reputation, owing to his success in the treatment of fractures and wounds incident to the fierce combats there practiced.

Owing to some seditious disturbances and popular commotions which occurred about A. D. 163–4, Galen, being in his thirty-fourth year, felt compelled to leave his own country and settle himself in the city of Rome. Here he remained but five years, in consequence of the envy and jealousy which he excited among the Roman physicians. His enemies taunted him with being a grammarian, a reasoner—a mere theorist and not a practical physician—and as a final and overwhelming objection, accused him of being a magician.

When Galen went to Rome he found the medical profession divided into numerous divergent and contending sects: dogmatists, empirics, methodists, episynthetics, pneumatists, and eclectics. Alas! were he to revisit the earth again, and attempt to locate himself in any modern metropolis, how much of an improvement in the unity of medicine would he find to have taken place during the lapse of seventeen centuries!

Galen, imbued with the spirit and knowledge of his ideal master—Hippocrates—endeavored to lead the physicians of that city in the only true line of investigation and progress, which is the careful observation of nature. In this he met with poor success, as he never escaped the persecution of the medical sects, in consequence of which—and it is said also on account of the sudden breaking out of the plague—

he quitted Rome and again returned to Pergamus. While in Rome he gained a great reputation for an extensive knowledge of anatomy and medicine. It was here that he wrote his work, *De Hippocratis et Platonis Decretis*, the first edition of his work, *De Anatomicis Administrationibus*, and some other treatises.

He tells us that he excited so much envy and ill-will among the physicians there by his frequent and successful disputations, lectures, writings, and practice, that he lived in mortal dread of being assassinated or secretly poisoned by them.

He, however, made the acquaintance, and acquired the friendship, and secured the patronage of many of the most influential families in Rome. Among others, Eudemus, a celebrated peripatetic philosopher, whom he cured of a dangerous fever; Sergius Paulus, prætor of Rome; Barbarus, uncle of the Emperor Lucius; and Severus, the consul, and subsequently Emperor. Above all, he was esteemed by Bœthus, a consul, for the recovery of whose wife he received the handsome fee of four hundred pieces of gold. In the presence of this person he made some dissections, and demonstrated the organs of respiration and of the voice. In one of his works he gives a full account of his first visit to Rome, and of some of his most remarkable cures. He says that he was at last called, not only "the wonder-speaker," but also "the wonder-worker."

He had scarcely settled himself into the routine of his ordinary course of life in Pergamus, when he received a summons from the joint Emperors, Aurelius, the pure and excellent, and Verus, the profligate and licentious, to attend them at Aquileia, in Venetia, the chief bulwark of Italy on its north-eastern frontier, whither they had gone in person to make preparations for the war with the northern tribes, and where they intended to pass the winter. Galen performed a part of the journey through Thrace and Macedonia on foot. He arrived at Aquileia about the close of the year 169, shortly before the plague broke out in the camp with great fury and violence. The two Emperors, with their court and a few of the soldiers, made a hasty retreat to Rome, and on their way Lucius Verus died of hæmorrhage, or apoplexy, being but thirty-nine years of age. Galen followed Marcus Aurelius to Rome, but excused himself from accompanying the Emperor into Germany, whither he was going to conduct the war on the Danube. This great physician felt that he must obey the will of the god Æsculapius, who had warned him in a dream never again to leave the city of Rome. Having escaped the journey with the Emperor and the dangers and hardships of the campaign, he was placed in charge of Aurelius Commodos, then nine years of age, son of the Emperor, whose health during his studies under Pitholaus, and during the absence of his father, was intrusted to Galen. The prince was attacked with a severe fever, from which he made a complete recovery. Galen was equally fortunate in his treatment of Sextus, another son of the Emperor, and afterwards Emperor himself, who was suffering from the effects of repletion, and not from ague, as his other physicians had predicted. This diagnosis of the royal dyspepsia did much to establish his fame, for the Emperor exclaimed: "We have but one physician; Galen is the only man of the faculty." Rome was his residence for the remainder of his life. The physician of the present day who can make a diagnosis independently of malaria deserves imperial honor and patronage.

On the death of Demetrius, A. D. 170, Galen was commissioned by M. Aurelius to prepare for him the celebrated compound medicine called *Theriaca*, of which the Emperor was accustomed to take a small quantity daily. About thirty years afterwards he was employed to make up the same medicine for the Emperor Septimus Severus. Galen probably died in the year 200 or 201. There is, however, much discrepancy among writers as to both the time and place of his death. The place of his death is not given by any Greek author. Some affirm that he returned to his native city at the age of eighty and died there; others that he died in Palestine; and Cælius Rhodiginus states that he lived to the extraordinary age of one hundred and forty years. Suidas says he died at the age of seventy, which is the time generally accepted. Medals were struck in his honor by his native city, Pergamus. There have been many engravings of Galen; they are all without the least authority and are purely ideal, and, of course, differ from each other according to the fancies of the artists.

Galen's personal character, as it appears from many passages in his works, places him among the brightest ornaments of the age in which he lived. His writings, now extant, furnish the strongest proof that he was a man of profound learning and of the highest accomplishments. Perhaps his most glaring faults were his inordinate vanity, and his bitterness and contempt for some of his adversaries. He has not hesitated to recite his own cures and vaunt his own praise. These may have been the result of the opposition, envy, and persecution of his numerous enemies, and have been but a reflex of the antagonistic spirit of the medical sects. Can we not afford to excuse all this in Pagan Galen, when we consider that even in our Christian civilization those faults are still found not to be eradicated from the human heart? Galen, though a Pagan, did not fail to recognize the power, wisdom, and goodness of an Almighty Architect. The following fine and oft-quoted passage is to be found in his admirable work, *De usu Partium* :

"In writing these books, I compose a true and real hymn to that awful Being who made us all; and, in my opinion, true religion consists not so much in costly sacrifices and fragrant perfumes offered upon his altars, as in a thorough conviction impressed upon our own minds, and an endeavor to produce a similar impression upon the minds of others, of his unerring wisdom, his resistless power, and his all-diffusive goodness. For, his having arranged everything in that order and disposition which are best calculated for its preservation and continuation, and his having condescended to distribute his favors to all his works, is a manifest proof of his goodness, which calls loudly for our hymns and praises. His having found the means necessary for the establishment and preservation of this beautiful order and disposition, is as incontestable a proof of his wisdom as his having done whatever He pleased is of his omnipotence."

This is language worthy to have been written by the most devout of the holy fathers.

The remainder of this sketch will be devoted to the consideration of the works of Galen.

[To be Continued.]

# EDITORIAL DEPARTMENT.

## INFANTILE CIRCUMCISION A CAUSE OF CONTRACTION OF THE EXTERNAL URETHRAL MEATUS.

The contribution on "Genital Irritation," with the editorial discussions of this and "Indiscriminate Circumcision," which have appeared in our recent issues, render the subject of reflex phenomena, as produced by such causes, of sufficient interest for still further remark in these pages, and we desire now to indulge in a few words concerning contraction of the meatus urinarius externus in the male, with especial reference to the frequency of such narrowing as existing in a particular sect and race; or, in other words, directing the attention of the profession to a diminution in the size of the external urethral orifice as a direct result of the religious rite of circumcision practiced in early infancy among the Hebrews.

Without denying or even criticising the correctness of the views advanced by Dr. Sayre respecting adherent prepuce and phimosis in childhood as originating a certain reflex trouble—"reflex paralysis"—through the genital irritation produced thereby, we must express ourselves in perfect accord with our associate—Dr. Newton M. Shaffer—regarding the very *wide abuse* of the operation of circumcision as performed for such nervous disorders; for, whilst we have never witnessed a single case of paralysis referable to this kind of irritation as a cause, we do know of several instances, on the other hand, where ablation of the foreskin was practiced without benefit—and, it need scarcely be said, unnecessarily—in children whom a further examination proved to be suffering from a grave organic lesion. There have come under our observation, however, not a few functional derangements which were directly traceable to some interference with the proper hygienic condition of the genito-urinary apparatus, among which were phimosis and adherent prepuce, since prompt and entire relief was effected by a removal of the exciting causes, and it was only these other reflex derangements as produced by another, and fertile, source of genital irritation—namely, contraction of the urethral meatus—in connection with the frequency of such contractions among the Jews, which will engage us in this note.

That a strictured meatus is capable of producing a long train of unpleasant symptoms, affecting especially the urethra and bladder behind it, has been firmly established, we believe, as a fixed surgical principle, mainly through the observations and exertions of Dr. F. N. Otis, but that these annoyances and cause for such are more often encountered in a particular people, has never been suggested, as far as we are acquainted, and hence the subject of this occurrence is deserving of careful consideration by the profession.

To Dr. Claudius H. Mastin, of Mobile, is due the recognition of this fact. In an extended urethral practice his attention was first drawn to the very large number of Jewish youths and adult males who sought advice for gleety or chronic urethral discharges, and irritable urethræ, and in each case he was surprised to find the meatus narrowed to a degree entirely out of proportion to contractions generally observed, and, indeed, usually so much diminished in size as to prevent the passage of a sound bearing even a relative approximation to the urethral calibre.

Free *débridement* of the constriction—incising the orifice to the full capacity of the individual canal—and the after-use of large steel instruments, afforded immediate and permanent relief in every single instance.

Again, every opportunity which presented itself of examining the penes of Jewish infants and children was taken advantage of, and here, too, the contracting or already contracted meatus only added evidence to strengthen and confirm his conclusions. Another point of value in this connection is the general opinion among the Jews themselves in this section. They have been so thoroughly convinced of this "smallness" among their race, and the benefit to be derived from a free division of the outlet, that the operation has been designated by many of them as their "Second Circumcision," and, on several occasions, young men of this class who were not suffering from any trouble, but fearing it, have applied for operation to prevent any future annoyance from this defect.

The lesson taught by these observations was that there must be some cause which *alone* existed in the Israelitic race, since its so frequent occurrence could not be explained reasonably on general and ordinary grounds; and hence, after several years of attentive study of these cases, he was forced to the conclusion that circumcision was the prime and exciting cause of the stenosis. These deductions were based upon the inflammatory changes that are known to result from long continued irritations applied to the mucocutaneous surfaces surrounding other outlets of the body, as, for example, occlusion of the lachrymal puncta, and incurvation of the tarsal cartilages with inversion of the lids in entropion, although in the production of the latter malady there is a *muscular* element at work which does not exist in the meatus—conditions which he considers eminently applicable to the external urethral opening after removal of the prepuce; and the theory which he advances is briefly and hastily as follows:

At the tender age of early infancy (eighth day after birth), the glans penis deprived of its natural protective covering—the foreskin—is exposed at a period when it is covered with a membrane resembling mucous much more than cutaneous tissue, which is ill adapted to, and is really incapable of resisting the irritative, and often inflammatory, influences which this exposure brings about; and hence the atmospheric exposure and the friction by the napkin encircling the child's pelvis, or any rough article of apparel which it may wear, produces a rapid transition from a *semi*-mucous to a *full* cutaneous surface, and thus furnishes the conditions which he believes to be productive of the contraction. These conditions are an alteration in the elements of the covering tissue of the glans which causes a thickening and hardening of the surface of the glans, with exudation of plastic material, especially around the meatus, at which point the line of demarcation between a cutaneous and mucous surface asserting itself, a firm, resisting ring is formed, and through the inflammatory deposit here placed—partaking of the character of cicatricial tissue—the edges of the meatus are gradually contracted, and, of course, in proportion to the action of the exciting causes. Often these causes are so badly borne that actual excoriation takes place, and, necessarily, an increased infiltration of cicatricial deposit. And, furthermore, he has examined two cases where a thin section from the pointed extremity of the glans had been removed, undoubtedly, by an inexperienced or careless manipulator during the operation of circumcision. To summarize, the points of particular note in connection with these cases are:

First—The frequency of the contraction. This the investigations demonstrate to be almost universal, for of the whole number of examinations the records indicate a *marked* narrowing in *every instance but one;* hence it is believed to exist in, at least, 95 per cent. of all cases.

Second—The degree of contraction. The limit of these remarks will not permit us to indulge in the tempting discussion of the capacity of the healthy urethra and meatus, and especially of the expressed opinions of Dr. Otis regarding the normal size of the urethral meatus, or, as he designates it, "the *highest normal type*" meatus, but we can simply assert that the degree of stricture found in all the patients examined was sufficient to have been regarded as a *pathological* change by even the most conservative surgeons who declare the meatus to be normally the narrowest portion of the entire tube. In other words, stricture existed from a narrowing of about ten or twelve millimetres to an opening which would admit only the entrance of a filiform bougie, and the medium contraction between these extremes was the rule.

Third—The density of the contractile deposit. This was decidedly an observed feature, the character of the stricture tissue being firm, organized, and offering noticeable resistance to the knife. It was observed, also, that this organic deposit often extended into the fossa, the lips of the opening presenting the appearance of skin for some little distance into the canal.

Fourth—The little tendency to hæmorrhage. In many the bleeding following *débridement* of the meatus scarcely amounted to a dozen drops, and in all cases hæmorrhage was noted as *insignificant.*

The majority of these individuals applied for relief of obstinate chronic urethral discharges. With these the almost invariable history was to the effect that they had contracted a discharge about the period of puberty which had continued at intervals until the present time—being checked by ordinary astringent injections and a few days of abstemiousness, but reappearing upon the slightest sexual or vinous indulgence—and some even maintaining their inability to consummate the sexual act without contracting a fresh blennorrhagia. Here the contracted meatus was the source of no trouble until these persons arrived at the state of full pubescence, when the excitement with a certain degree of genital irritation often attending frequent gratification of the venereal appetite at this age—or, mayhap, a true gonorrhœa is received—produces an urethritis which but developes a source of irritation that had been lying dormant for many years, just waiting, as it were, to be called into activity by the kindling spark.

The next in rotation were those cases suffering with irritable urethræ. These presented in substance the history above detailed, with the addition of excessive irritability of the urethral tract, genital neuralgias, and, in some instances, vesical complications.

The third class of applicants consisted of those affected with spasmodic contractions of some portion of the urethral tube, dependent upon this reflected irritation. This group of cases were not numerous, by any means, but consisted of a number sufficient to establish the assertion of the existence of such reflected spasm. And, lastly, one case was met with of nocturnal urinary incontinence. This was in the person of a lad sixteen years of age, who had been thus afflicted for several years. All medical and surgical remedies had been employed without avail, moral persuasions exhausted, and, as a *dernier ressort*, the meatus, which was contracted to a medium degree, was opened to the full urethral capacity. Improvement soon became evident, and, by this simple operation, together with the introduction of metallic sounds, in a short time his distressing condition was changed, and perfect health restored.

Of the correctness of the deductions of Dr. Mastin we feel perfectly assured, and we express our unqualified endorsement of his views upon this subject.

Not only has it been our good fortune to witness a large proportion of his cases and follow up his investigations, but it has fallen to our lot, also, to encounter quite a number of analogous cases among our own clientelage; and hence, we are convinced that there can be no reasonable uncertainty in regard to the very much greater occurrence of this stricture among the race in question. Whether subsequent investigation will substantiate the opinion entertained of the almost universality of the defect is more than we can predict; but we are satisfied that further research will establish the fact that contracted meatus in the Jew is the *rule* and not the exception, and it is to be hoped that both surgeons and specialists in the department of genito-urinary surgery will give the matter some attention, and, after a sufficient and unbiassed examination, add their testimony for or against it.

In conclusion we would suggest, as a means of determining the relative frequency of contracted meatus, and defining the position that circumcision occupies in producing it, a careful examination of a *large* number of individuals, and an extended comparison of measurements of the urethral meatus of the Jew with the Christian, or, perhaps better, with the Negro—since the latter race is known to possess, as a general rule, a very redundant foreskin.

These comparisons and measurements, if carefully made and sufficiently numerous, would be not only of great surgical interest, but, at the same time, would assist most materially in answering the questions involved.

WILLIAM M. MASTIN.

# CHROMIC GUT. ITS METHOD OF PREPARATION AND BEHAVIOR IN LIVING TISSUES.

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THERE are few things more important in the immediate treatment of a wound than the choice of a ligature. Formerly, threads of various substances, such as silk and hemp, were in vogue. The object then seemed to be to procure the thread which was strongest, without considering at the same time whether it might set up irritation in the wounds. The ends of these ligatures were left long and hanging from the wounds. As they could only be removed after they had ulcerated their way through the coats of an artery, there generally was a discharge of pus, which rapidly became putrid as the long ligature established a conduit by which putrescence penetrated to the very interior of the wound. Pyæmia was thus readily induced. Within recent years silk ligatures have been used, but, instead of having their ends long, they have been cut off close to the artery, in the hope that the silk might become encapsuled, as it sometimes does, and thus avoid irritation. This, however, cannot be depended on, and often the irritation induced keeps the wound open until the detergent action has severed the noose, which is then washed out with the discharge.

Carbolized gut has been extensively used in surgical practice for the last ten or twelve years, and for ordinary purposes answers admirably as a ligature. It occludes the mouth of the vessel, produces no irritation in the wound, and becomes absorbed. This latter point, while one of the qualities of carbolized gut is also its source of weakness, or at least limits the extent of its use; it softens in contact with the living tissues in twelve to twenty-four hours, and therefore is unreliable for the ligation of arteries in their continuity, or for any purpose which requires the persistence of the gut in its integrity for several days. What was desired was a ligature which would possess the qualities of strength sufficient to cause the internal and middle coats of the artery to yield, which would produce no irritation in the wound, and which would resist the softening absorbent action of the tissues for a week or a fortnight, and which would ultimately be absorbed.

I endeavored to secure this, and tried a series of experiments, with a variety of substances. The end might be gained in two ways—by preparing the gut differently, or by substituting some other material for the gut. The latter was first aimed at; but, after trying a number of different materials, among which were various animal textures, they were one after another renounced in favor of ordinary cat gut, as it could be obtained cheaply and in unlimited amount. Attention was therefore directed toward preparing the gut in such a way as to resist the action of the living tissues for a longer period than the ordinary carbolized gut did. With the object of tanning the gut and making it more tenacious, many substances were used—*i. e.*, decoction of oak bark, tannic acid, alum, chromic acid. The latter had long been used for hardening animal textures to prepare them for microscopical sections, and attention was directed toward it, from a manufacturing point of view, as it was proposed for tanning leather. Chromic acid was, on the whole, found most suitable. If chromic acid be applied directly to the gut, deoxidation of the animal matter ensues, and the same thing happens if it be added in its pure state to glycerine—in both cases a char ensuing. Watery solutions of chromic acid, unless excessively diluted (1-2000 to 1-6000), render the gut hard and brittle. It was found, however, that a watery solution of chromic acid could be added to glycerine, which, while resulting in a deoxidation, yet left a mixture which possessed some of the softening quality of the glycerine, and which, at the same time, toughened the gut. By using such a mixture, a gut was prepared which resisted the action of the living tissues, practically for an indefinite period. A portion of this gut, when removed from the tissues in which it had been imbedded for over two months, was found quite unchanged at the end of that time. An endeavor was next made to obtain a solution which would prepare a gut that would only resist the action of the tissues for a few days, which, after a few trials, was secured; so that, by using a strong solution of chromic acid, a gut was obtained which resisted the action of the living tissues for at least two months, and by a weak solution gut was prepared which softened in the tissues in a few days. It was then apparent that, by using solutions of strengths between the "strong" and "weak" solutions, a gut could be made which would resist the action of the tissues for any time desired. It was then a mere matter of experiment. It was first desired to find a gut which would resist the action of the tissues for a fortnight, and which would then soften and ultimately absorb. This was secured by preparing a watery solution of chromic acid 1-5, and adding one part of this to 20 of glycerine. The gut was kept in this solution for two months, when it was found ready for use. The gut might be allowed to remain in this solution for six or eight weeks without adding greatly to its resisting powers; but it is preferable to remove the gut at the end of two months from the chromic solution, and, after washing and drying it, place it in one of carbolic acid and glycerine 1-5.

Gut prepared in this way has been in constant use in my wards and surgical practice since 1877, and has proved very satisfactory. The time occupied in its preparation is, however, a drawback, and more recently an endeavor has been made to obtain a gut which would resist the action of the tissues for the same period, but which could be prepared in a much shorter time.

This likewise has been attained. By taking one part of the 1-5 water solution, and adding it to five parts of glycerine, a gut can be prepared in a week which will resist the action of the tissues nearly as long as the one to twenty for two months. This gut would be sufficient for most purposes. If the gut be kept in the same solution for a fortnight instead of a week, it will resist the action of the tissues for a longer period. The gut is removed at the end of a week, or fortnight, as the surgeon may desire, and stored in a 1-5 solution of glycerine and carbolic acid.

If a gut is desired which will only resist the action of the tissues for five to eight days, such as might be used as sutures in flaps, then the gut ought to be kept in the above solution (one part of the 1-5 watery solution to 5 of glycerine) for four days.

In endeavoring to secure a strong ligature, good gut must be had to start with. Much of the gut sold is brittle, and gives way to slight strain. A brittle piece of gut will never make a strong ligature, no matter what solution it may be steeped in. The crude gut improves on keeping; it gets harder and tougher. So it is important to get good, thoroughly dried, old gut, and from that a good ligature may be obtained.

## THE BEHAVIOR OF CHROMICIZED GUT IN THE TISSUES.

Three very important questions arise regarding the efficacy of any ligature. First—Does it produce irritation in the tissues? Second—How long does it act efficiently as a ligature? and Third—When does it become absorbed?

In answer to the first query—does it produce irritation in the tissues? it is plain that it does not do so, from the large number of cases in which it has been used showing no signs of irritation about the wounds. A good test is to place a ligature round a vessel in its continuity, when, if the wound heals without pus production, and abscesses be not afterwards formed, it may be concluded that the ligature has not produced irritation. Two such cases may be mentioned here. A ligature of chromicized gut was placed by me on the common carotid of a man about middle age, affected with aneurism at the bifurcation of the carotid artery. The wound healed without pus production. The patient was kept under observation for six weeks, during which the aneurism disappeared. He was then dismissed, but reported himself six months after. There was then no trace of the former swelling, and he stated that the wound never re-opened. There was no abscess at any time, and the ligature was never heard of. Another patient, about forty years of age, had a chromicized ligature applied to the femoral at the apex of Scarpa's triangle, for popliteal aneurism. The wound healed without production of pus. He was kept under constant observation for some months, and he reported himself a year afterwards. The aneurism was cured, there had been no re-opening of the wound, and the ligature had never been seen again. In a case of strangulated hernia, besides the constricted gut, a large portion of omentum was found in the sac. The omentum was gangrenous. Four chromicized gut ligatures were inserted in the proximal side of the gangrenous part, which was then removed. The ligatures were never seen again, the wound healing as an aseptic wound does. The patient reported himself some months after in perfect health, which he had enjoyed since his dismissal.

The second question is the length of time during which the ligature will maintain its hold in the tissues before being softened? With a view of determining this point, the various chromic guts have been used as deep and superficial stitches. The softening of the gut was measured by its yielding to traction applied to both extremities of the stitch, and its absorption was regarded complete when the outer portion of the stitch was found lying detached on the outside of the wound. The various guts have been tested as follows:

(1.) Gut steeped for two months in a mixture of one part of a 1-5 watery solution of chromic acid to twenty of glycerine, was used as a deep stitch in thirty-one instances. The earliest time in which it was found softened to such an extent as to yield on traction was nine days; the longest nineteen; the average fourteen. In another series of cases the gut was left in the tissues until it became absorbed. It was found that this process was completed between the fifteenth and the twenty-fourth day, the average being the twentieth day.

(2.) Gut steeped for one week in a mixture of one part of a 1-5 chromicized watery solution to five of glycerine was used as stitches (mostly deep sutures), in 75 instances. The shortest time in which it was found to give way on strain was five days, the longest eighteen, the average 10.9. In another set of experiments, it was left in the tissue until the gut comprising the outer part of the stitch became detached. It was found to take twenty-one days on an average to be absorbed.

(3.) Gut steeped in the same solution as (2), but retained in it for two weeks, will on an average resist the action of the tissues for fifteen days.

(4) Gut steeped in the same solution as (2), but retained in it for four days, has been tested in fifty-one instances. The shortest time in which it was found to give way on strain was the third day, the longest the seventh day, the average being the fifth day. It was found to be absorbed on an average by the tenth day. This gut does excellently as a suture for wounds.

It will be observed that within certain limits there is a variable time during which each particular kind of gut may be absorbed. This is occasioned by the degrees of molecular vitality exhibited by the tissues, into which the gut is inserted. This varies according to the individual, and according to the particular locality in the individual into which it is placed. Of course it must be in contact with living tissue before absorption takes place. Stitches have remained in contact with sloughs for weeks without undergoing much change, other than a slight softening; so that the tissues have a control over these ligatures. The greater the normal molecular activity, the quicker will the wound heal, and the sooner will the chromic gut be absorbed; the weaker the vitality, the longer will the healing process take, and the longer will the ligatures retain their hold. It must be understood that in testing these stitches, the surgeon must not subject them to daily or frequent movements, otherwise their connections with the living tissues become broken, when they will last for a much longer time.

Besides using chromic gut as a ligature, it may be employed in many other ways, such as in the radical cure of hernia. For this purpose the gut prepared in the chromic solution 1-5 for a fortnight (3), is strong enough to bring the pillars of the ring firmly together, and its durability is such that by its intrinsic force it maintains them together for at least a fortnight. In closing such a wound a button suture is introduced, the gut being prepared in a chromic solution 1-5 for a week (2), and this will be expected to last for about a fortnight; while the superficial stitches are of gut prepared in a chromic solution 1-5 for four days (4), which maintain the edges of the wound together for about a week.

In the after treatment of the wound, no stitches require to be cut; they serve their purpose, then become absorbed.

# THE USE OF PLASTER OF PARIS AS AN IMMEDIATE DRESSING IN THE TREATMENT OF COMPOUND FRACTURES.[1]

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PRECISELY what to do for a bad compound fracture is a problem, very often, to a conscientious and careful surgeon; it was the same a century ago. It is not impossible that the compound fracture made by the sling of David would have caused the surgeon of Mr. Goliath, had he not been killed outright, as much annoyance as the slings of other men cause the surgeons of the present day. It cannot be denied that the treatment of to-day is better than that of one, or even one-quarter of a century ago; that this improvement will continue is assured by the natural order of things; however, in the future, as in the past, advancement will be made slowly; the foundation principles of treatment will hardly be changed; they were not laid in this generation, nor will they be overturned in the next. The most we can hope to do is to work diligently, observe carefully, and commend with discretion. It will be no part of this lecture to describe the first compound fracture or to claim for myself any originality in the treatment of these injuries. I shall not enter into a detailed account of the older methods; all this would require too much time, and bury the few facts I intend to emphasize beneath a mountain of detail—bury them so deeply that to clear away the verbiage would require the patience of a Job, if not the strength of a Hercules. I shall do, rather, what I can to suggest what seems to me to be additional means of safety and comfort in the treatment of the last case of compound fracture. If one but casts his eye backward over the history of the treatment of these injuries, he will be not a little surprised at the paucity of the literature on this subject, when compared with other and what are now considered to be less important themes. I shall not draw any invidious comparisons between the methods of our antecedents and those of the present day: they did what we do now, the best they could, and, as Edward Young once wrote, " Who does the best his circumstances allow does well, acts nobly —angels could no more."

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[1] A lecture delivered before the Anatomical and Surgical Society, of Brooklyn, N. Y., April 18, 1881.

Nearly all the methods employed up to the present day allowed, and .many even now allow, considerable movement of the joints above and below the fracture, while the immediate application of a dressing which shall surround the limb above and below the seat of the fracture has been, and is now very often, condemned as unsurgical and hazardous. These older methods, however, are not to be censured and ostracized, for they possess the merit of being commendable, so far as the ability to readily observe the limb relates to the safety of the patient. The older methods are to-day producing good results. I do not believe, however, that any who advocate and use them will contend for one moment for their supremacy, provided another and quite as safe method can be employed which will combine fixity of the fragments, with comfort and safety to the patient, together with cleanliness and celerity in dressing. I believe that the plaster of Paris splint, when immediately or somewhat remotely applied, cut up and attended by careful watching and regular thermometrical observations, will accomplish as much, if not more than any other agency yet described. I do not mention plaster of Paris to the exclusion of allied material; it is selected rather because it is most used, and the popular verdict seems to be in its favor; it is also within the easy reach of all. I am aware many objections are made against its use as a dressing, some of which will require careful and respectful attention, many of which are chimerical.

Before enumerating the real and asserted objections to its use, I will encroach upon your time and patience by stating as briefly as practicable the manner in which I have been accustomed to apply it—it being the method, with some variations, in which it was applied to each of the cases to which I shall direct your attention. The materials needed to comply with the demands are: One-quarter yard of oiled silk, one roll of cotton batting, five or six—depending upon the size of the limb—freshly prepared plaster of Paris bandages, a yard or so of old woolen blanket, sufficient rubber tubing for drainage purposes, an ordinary roller bandage, a -shaped clothes rest, one pound of oakum or marine lint, two or three pounds of loose plaster of Paris, a five per cent. solution of carbolic acid, a syringe, a good assistant, an axillary thermometer, and the last and most important item of all, a patient who, in this instance, we will assume to have received a compound fracture of the tibia. After the patient has recovered sufficiently from the shock to warrant an examination, the condition of the important vessels of the limb should first be ascertained, together with the extent of the injuries of the hard and soft parts, or if a joint be implicated. The immediate reasons for these precautions are obvious, since they are to decide the question of amputation. It is very important—if it be determined to attempt to save the limb—to ascertain the exact extent of the injuries to the soft parts, otherwise the splint may be made to cover up unnecessarily the morbid changes resulting therefrom. If an important vessel be injured, the care must be redoubled. The agents employed to ascertain the extent of the injuries of the soft and hard parts are probes—the best one being a carbolized finger, which can be introduced, if the opening be sufficiently large to admit it with ease, with less pain, and it will appreciate the exact conditions more clearly than any other. Vertebrated and flexible probes, used with caution, their passage coaxed—never forced—are usually employed. If the opening in the integument be small, the injury to the subjacent tissue limited and hæmorrhage be slight, the wound can be sealed. If the bone be comminuted, the loose fragments should be removed. It is well to indicate the extent of the injuries to the soft parts by circumscribing them with a line made with iodine or other suitable substance; this will aid in determining the proper size and shape of the prospective fenestrum.

Now, having enumerated the necessary precautions for the applications of the plaster splint, we will proceed with the detail of its application. The limb should be shaven for some distance around the seat of the injury; this will prevent the hair from clinging to the dressing, collecting discharges and becoming an active agent of uncleanliness. After this the surface of the limb and the cavity of the wound must be thoroughly cleansed by syringing it with the five per cent. solution of carbolic acid. It should be injected with sufficient force to enter the recesses of the wound cavity. Measures are now to be taken to secure complete drainage. This is a most important point, since it is the best means at our command to prevent burrowing of pus, the liability to which is one of the strong objections urged against this method. The limb must be placed in the position in which it is intended it shall remain during treatment;

then find the most dependent portions of the wound, and make openings from them to the external world at an angle that will secure complete drainage. This end should be secured irrespective of the amount of sound tissue necessary to be pierced. Through these openings pass the drainage tubes, using caution that they be not passed between the extremities of fractured bones, or in contact with important vessels. The external wound is then to be covered with oakum or marine lint, thoroughly wetted with the five per cent. solution of carbolic acid. This absorbs the fluids and prevents the entrance of septic agencies during the application of the splint. The whole limb should then be smeared with acid and oil (.05), and be surrounded by a piece of new disinfected oiled silk extending four or five inches above and below the injured part. The oiled silk is used to prevent the soiling of the splint; its ultimate arrangement will be described hereafter. Around the whole limb, extending above and below the contiguous joints, apply a single layer of cotton batting; it is advisable to add a second layer over bony prominences. The cotton batting is to be fastened in position by ordinary cotton thread carried spirally around the limb close enough together to cause it to lie smoothly. The cotton serves to equalize the circulation of the limb, prevent excoriations and constrictions. The plaster bandages are next to be applied, beginning at the metatarso-phalangeal articulations and carried upwards over the injury—as if the fracture were a simple one—to eight or ten inches above the knee; even higher, if there be great tendency to displacement of the fragments. In order to properly locate the extent of the injured part, each layer of bandage should be marked corresponding to the seat of the injury. In this manner, the mark on the last layer applied will indicate, practically, the size of the prospective fenestrum. As soon as the plaster has hardened sufficiently to be cut without displacement or crumbling, the fenestrum must be made. In cutting the plaster at this time, a very sharp knife must be used. Usually the fenestrum can be made within a few moments after the application of the splint, when it is said to cut like "old cheese"; its size and shape are, of course, indicated by the pencil mark upon the outer layer of bandage. This portion of the splint being removed down to the cotton wadding, and the cotton wadding corresponding to the opening having been taken away, cut a small hole through the oiled silk at the point over the opening in the soft parts, and divide it in a radiating manner from this opening toward the border of the fenestrum, at the same time removing the oakum or marine lint covering the wound of the integument.

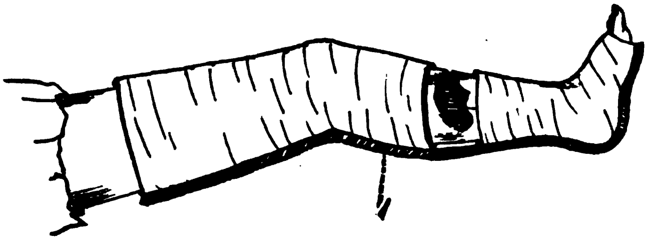


FIG. I. PLASTER OF PARIS DRESSINGS IN PLACE.

I. Posterior support in position.

The fenestrum should now be made to correspond in shape to and exceed in size somewhat the space included within the iodine line upon the limb, after which its borders must be protected from the discharges by turning the oiled silk over them and fastening it in position with adhesive plaster. If the wounds of the soft parts are of sufficient size to demand a large fenestrum, or more than one, either of which will lessen the supporting power of the splint, it becomes necessary to modify the application somewhat, as will be hereafter described. The knee should be bent to a proper angle during the application, so that the limb may hang easily when swung above the bed; it must also be extended sufficiently to overcome as much as possible any shortening that may be present. While making the extension, great care must be used, else the plaster will be pressed into the soft parts by the hands of the assistant, and if allowed to harden, will cause much pain, and may give rise to excoriations. The better plan—one which will reduce the dangers to a minimum—is to apply the splint by "piece-meal" (Fig. 2), as it may be called, which means to apply the portions below and above the fracture first; allow them sufficient time to harden, when extension and counter-extension can be made from these portions without danger of damaging or indenting the splint. The limb can then be firmly fixed by splicing in the interval between them with the same material. If the opening in the integument be very large, or the injuries of the soft parts be extensive, endangering sloughing or extended suppuration, it will be much better to apply what we will call an "interrupted form" of the splint, connecting the portions by means of a posterior support, which can be quickly made from the old blanket saturated with plaster mud. This support should be about

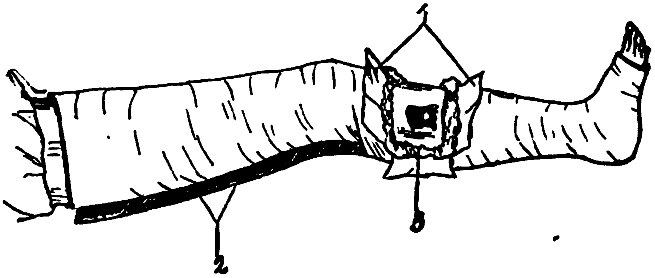


FIG. 2. "INTERRUPTED FORM" OF PLASTER OF PARIS SPLINT.

1. Oiled silk turned back to bind the splint at opening.
2. Posterior support as seen at thigh; covered on leg and foot by outer layer of bandage.
3. Antiseptic cotton packing between surface of limb and oiled silk.

two or three inches in width—depending upon the size of the limb—half an inch in thickness, and long enough to extend the whole length of the splint and sole of the foot. The limb must be extended before it is applied, and the posterior support be held in position till sufficiently hardened not to break or bend, then fastened in place by passing a plaster roller around it and the portions of the splint to which it is applied.

This gives us a truly interrupted splint; it can be varied somewhat by splicing the two portions as in the first instance, after which the posterior support can be applied as before. The splint having hardened sufficiently to maintain its integrity, place it upon a pillow or other soft substance, make the fenestrum, cut it up in front, bind it as previously described, after which cotton batting, or, what is better, antiseptic cotton, should be loosely packed between the limb and the borders of the oiled-silk binding; this will prevent the fluids from passing between the limb and the oiled silk. This packing must always be changed as soon as soiled; for, if it becomes soaked, it will allow the discharges to percolate through and pass between the limb and the oiled silk, causing excoriation and offensive collections. Having fortified against discharges, expose the extremities of all the drainage tubes, cleanse the wound again with the carbolic solution, apply to it the oakum or marine lint, saturated as before; around this apply enough of dry oakum to fill the fenestrum, bind it in place with an ordinary roller bandage drawn sufficiently tight to prevent pouting of the soft parts; in other words, to produce the same degree of pressure as that caused by the splint. The limb should now be swung and held suspended by some elastic agency, the most convenient being pieces of elastic tubing passed around the splint at suitable distances from each other, and tied to the uppermost bar of the clothes rest. Rubber rings may be used connecting the splint with the bar above by strips of bandage. The limb should be elevated sufficiently above the bed to admit of its free movement and comfort to the patient, as well as room beneath the splint to cleanse the wound without difficulty. Pulse and temperature should now be taken to serve as an indication of the influences upon them of any subsequent changes at seat of injury.

At last the tedious detail is completed, and I can now introduce to you a patient who, if the work has been well done, is entirely freed from pain, and should be quite as much at ease as the sudden change of surroundings will admit. It now becomes our duty to watch him—and when I say watch him, I do not mean in the ordinary sense of a daily call, or casual examination, but with the vigilance of an Argus. The slightest pain merits your instant attention; an abnormal change in the color or temperature of the soft parts demands a rational explanation. It may be truly said that the same demands must be respected in all methods of treatment. It is true that they should be respected in all methods, more especially in this where carelessness, lack of attention, or appreciation of dangers may produce disastrous results, which may cause the over-confi-

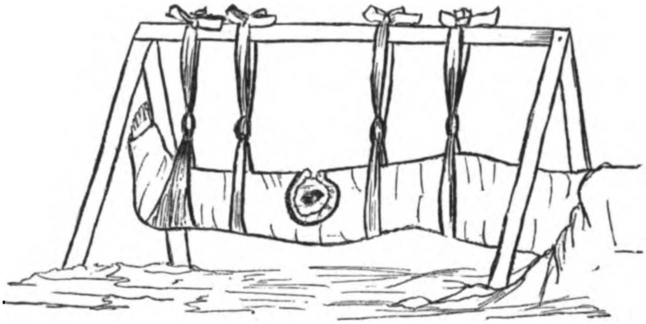


FIG. 3. POSITION OF LIMB WITH DRESSINGS COMPLETE.

dent surgeon to open an office in a distant town, or defend his professional reputation in a court of law. Compound fractures cannot be as safely treated with indifferent attention in the fenestrated plaster splint as in the fracture box, or other mentionable apparatus. If caution and care be bestowed, I believe compound fractures can be as well, if not better and more comfortably, treated by this than any other method in common use. It will be well, before proceeding further, to call attention to the dangers attributed to the use of plaster in these cases. I will at the same time state to you the methods I have employed thus far to successfully avert them. One of the objections urged against plaster as a dressing is, " it represses the insensible perspiration," "does not admit of the escape of surface exhalations." Not long since, in order to test the comparative porosity of different materials used for splints, water was put in a plaster splint of usual thickness, and, with time-piece in hand, the first trace of dampening of the under surface was watched for. In three and a half minutes its under surface was well dampened. To obtain the same condition of things with a pasteboard splint required nine and a half minutes, while at the end of twenty minutes neither a felt nor leather splint showed evidence of dampness. Each of these materials was in turn subjected to the force of a slow steam jet, and with like results. These facts seem to show that the plaster of Paris splint has much the greatest attraction for water, consequently absorbing the cutaneous exhalations rather than repressing them. Even if this were not true, is it probable that a splint with both ends open, having a large fenestrum, would "confine dangerous exhalations," "repress natural excretions," unless it be applied so tightly as to be dangerous from tangible reasons? Second objection: Congestion at the seat of the fenestra, which "increases inflammation," "promotes suppuration," and " tends to gangrene." In answer to this, the use of oakum, as mentioned in the description of the application of the splint, will prevent any such tendency by its constant pressure effects, and at the same time absorb the pus and other discharges into its texture. The Lister dressing firmly applied will meet the same indications. Third objection: That "the fragments move as readily in the plaster splint as in the fracture box, or other apparatus"; therefore, while "offering no additional advantages, it unnecessarily conceals the limb from observation." At one time this was practically true—true when the plaster splint was allowed to lie on the bed and did not confine the contiguous joints. Now, however, the joints are confined, the limb swung, thus allowing less movement of the fragments than if allowed to lie on an immovable surface. Fourth objection: The same as those urged against plaster in general. "It is dangerous from gangrene, ulcerations and delayed union," assertions not founded upon observation, nor sustained by hospital experience. See *American Journal of Medical Sciences*, S. B. St. John, M.D., July, 1872. Fifth objection: "It cannot be safely applied by other than experts." This idea is chimerical; if it be true, public teachers alone are to be blamed. Many of us have heard gentlemen of acknowledged authority advocate its use in the lecture room and clinic, extol its advantages, in fact, admit everything that can be reasonably claimed for it, and finally end an elegant peroration by saying "its use cannot become general, it must be limited to those of experience and observation;" "it cannot be applied by other than experts," and other platitudes of like import. I do not intend to speak harshly of these gentlemen, they undoubtedly acted with conscientious caution; for one who is accustomed to teach a class of medical students, a class made up of all orders of intellect and appreciative power, must perchance practice methods himself which cannot with safety be recommended to the multitude. I do claim, however, that if greater pains were taken to explain it, to state the modifications and means used to avoid certain dangers, that, that which the student is led often to look upon as a Nihilistic bomb, he would come to consider and use as an agent of comfort productive of praiseworthy results. If, before leaving the patient, the splint be "split up" and tied in position by strips of bandage, which can be loosened if pain occurs, it then becomes as safe—when properly swung—as any other agent at our command; for it can then be sprung apart, permitting an examination of the whole length of the limb without disturbing it (Fig. 4). Sixth objection: "The limb cannot be inspected during treatment as well as if it were in a fracture box, pillow, etc.," hence the greater danger from "burrowing pus," "abscesses" and "erysipelas." This objection is really the important one; without these dangers this treatment would necessarily be open to little criticism. How can they be surmounted is naturally a question of great importance. The precautions previously mentioned will again be called to your attention, because a strict observance of the following points has on previous occasions been suffi-

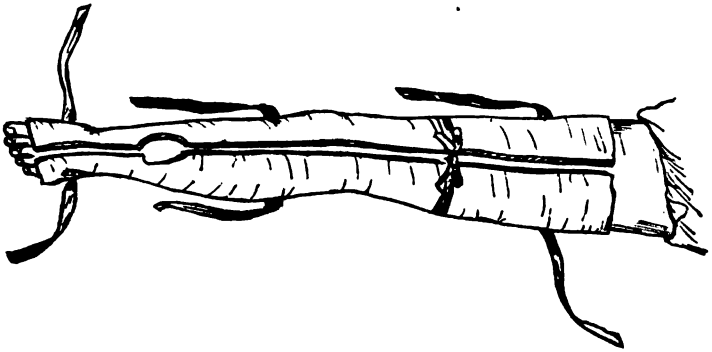


FIG. 4. PLASTER OF PARIS SPLINT SPRUNG APART AND TIED IN POSITION BY STRIPS OF BANDAGE.

cient to prevent all the dangers enumerated under the sixth objection: First—Ascertain by the finger or probe the exact extent of the injuries of the soft and the hard parts. Second—Examine the integrity of the vessels. Third—Circumscribe their area by a line of iodine, or other suitable substance. Fourth—Make the fenestrum a trifle larger than the circumscribed area. Fifth—Secure complete drainage. Sixth—Open the splint along its anterior border from top to bottom, allowing the limb to rest in it as if it were in a closely-fitting boot. Seventh—Keep an accurate record of the pulse and temperature twice daily, in addition to which a record of the respiration may also be kept. I have seen cases treated with only a majority of these precautions, and nothing occurred with perhaps but one exception to compromise the method. The cases which now follow came entirely under my own care or observation. I can, therefore, vouch for the accuracy of the records, since they were, with but three or four exceptions, made by myself. They are introduced at this late day to show something of the history of the development of the method at that time, giving its inception and the gradual improvements which led to its final completion.

CASE I. (Dr. J. G. Curtis.) This is the first case, so far as Bellevue Hospital Records show, in which the fenestrated plaster of Paris splint was applied in the Hospital for compound fracture. I find in the notes kindly furnished me by Dr. Curtis the following entries: The fracture was located at the middle and upper thirds of the tibia; was at first simple, but restlessness of the patient caused suppuration, followed by exposure of the tibia. Injury first treated in a fracture box, subsequently placed in a fenestrated plaster splint, and laid upon a pillow; made a rapid and complete recovery. It will be noticed that no record of pulse or temperature attends the report of this case; the importance of these elements of safety was not at that time appreciated.

Case 2. (Dr. J. G. Curtis.) Compound comminuted fracture of right tibia and fibula involving the ankle joint. Secondary hæmorrhage from the anterior tibial; amputation; death from shock. William M., aged 28, laborer; habits good; healthly in all respects; injury caused by direct violence; much laceration of soft parts at seat of fracture; constant oozing of blood; pulsations of posterior tibial normal, and those of the anterior indistinct, caused, as it was thought, by swelling and bloody effusion. Put in fenestrated plaster splint immediately, extending to the knee, being separated from the limb by a finger's breadth of cotton batting. Ice applied to seat of injury, splint resting upon a pillow, pulse and temperature taken twice daily; progressed favorably till the fifteenth day, then, while changing him from his bed, arterial blood gushed from the wound. Hæmorrhage controlled by pressure. On the second day following another hæmorrhage occurred, accompanied by a sudden rise in temperature and a flushed appearance of the surface of the wound. The splint was removed, revealing a large, slightly pulsating thrombus on the outer and anterior portions of the limb, middle third. The limb was amputated at the knee; and the patient died from shock. Post-mortem examination of limb showed anterior tibial nearly severed, with a fibrinous plug in proximal portion, distal open and communicating with blood thrombus before mentioned.

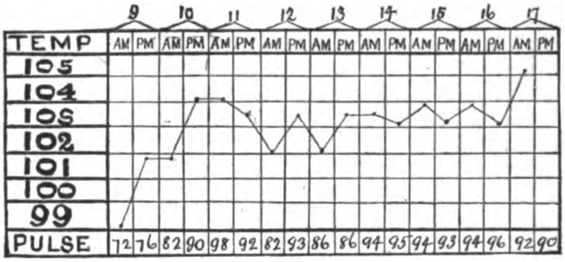


FIG. 5. DIAGRAM SHOWING THE VARIATIONS OF TEMPERATURE AND PULSE IN CASE 2.

Here is a case to which the sixth objection applies with all possible force. If, in this case, the plaster splint, at the time of its application, had been cut up in front and the limb allowed to rest in the plaster boot, which could have been opened daily for inspection and suitably readjusted by a simple roller, or by tying around it strips of bandage, the thrombus could have been detected as soon as visible. In all cases where the circulation is obstructed this precaution must be observed. In the present instance, however, this method was in an embryonic state, and very many of the precautions now enjoined for the patient's safety were at that time unappreciated, if not unknown. The pulse and temperature records are instructive; and it is to be remembered that this is the first case in which such a record was kept. A high temperature on the 10th and 11th occurred, due, no doubt, to the symptomatic inflammation attending the injury. The rise in temperature on the 17th was due to the erysipelatous manifestations of the wound, together, no doubt, with the septic influence of the decomposing clot discovered beneath the splint. It was noticed that, after the 12th, the pulse preserved a general uniformity, more so than usually occurs with an attending high temperature. Attention is especially called to the fact that, on the forenoon of the 17th, the temperature was 105°, while the pulse was but 92, being less than on the three preceding days, which teaches us the fact that, in connection with this case, a high temperature was of far greater significance than the pulse record. This, perhaps, may be explained by the fact that the general strength of the patient had not been much lessened by the septic conditions attending the injury, the marked onset of which can, no doubt, be said to have commenced on the forenoon of the 17th. It is plainly shown, however, that the vital forces of the patient had been greatly undermined, since he never rallied from the shock of the operation. In this and the following cases the temperature was taken in the axilla.

CASE 3. (Dr. J. G. Curtis.) Compound fracture of tibia and fibula at the junction of middle and lower thirds; plaster splint immediately applied. Gustav V., laborer, aged 32, admitted August 20, 1870; robust and temperate; injury due to direct violence; external wound small, little oozing of blood; slight shortening of limb; wound sealed; plaster splint applied from knee downward, one thickness of cotton batting employed, limb swung by elastics. The seal converted the injury into a simple fracture, which made a complete though somewhat tardy recovery. No necrosis.

This case was not attended by any complication. The extremes of temperature were not great. The pulse and temperature bore a fair relation to each other. This is the first case to which elastic suspension was applied.

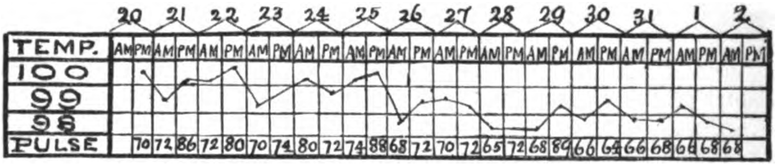


FIG. 6. DIAGRAM SHOWING THE VARIATIONS OF TEMPERATURE AND PULSE IN CASE 3.

CASE 4. Compound comminuted fracture of right tibia and fibula at junction of middle and lower thirds. Male, aged 24; habits good; good family history; injury due to direct violence. Wound of soft parts one by one and a half inches at junction of lower and middle thirds, leading to the seat of fracture. A piece of bone one inch in length, comprising the whole thickness of the tibia, was removed; much displacement of fragments, one and a half inch shortening; limb much swollen, suppurating, containing maggots. First put in fracture box and confined by the blanket padding. On account of great tendency to displacement of the fragments, a plaster of Paris splint was applied extending to the knee, separated from the limb by three layers of cotton batting. Extension was applied to the splint to overcome shortening. This reduced the shortening to one inch. It was removed, however, on account of pain, which it caused at heel and in-step. The splint was then removed, and the extension applied to the bare foot, over which a splint was again placed (see Fig. 8). This reduced the deformity to less than one inch, but the upper fragment continued to move at the slightest cause. Plaster of Paris splint removed and limb replaced in fracture box, extension continued. Patient recovered with a useful limb one inch shortened. Recovery protracted on account of necrosis. Had the plaster splint in this instance been carried above the knee, the fragments could have been well controlled. Temperature increased on the 5th, 6th and 7th, due to inflammation, producing abscess; on 15th and 16th to same cause.

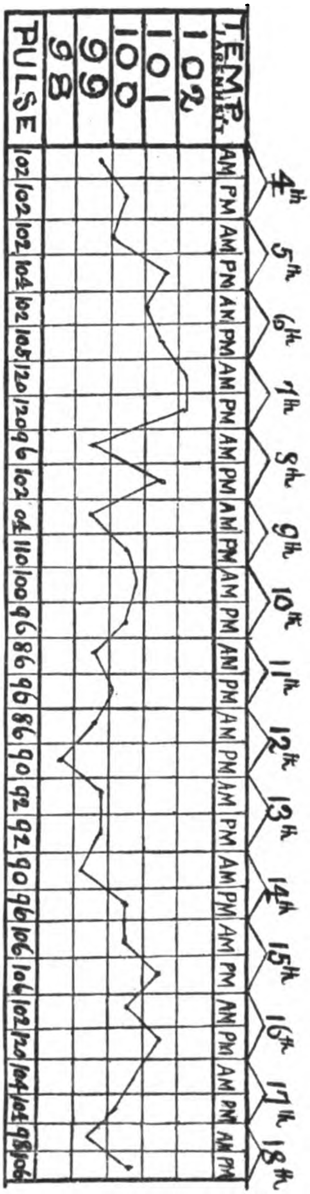


FIG. 7. DIAGRAM SHOWING THE VARIATIONS OF TEMPERATURE AND PULSE IN CASE 4

CASE 5. Compound fracture of right tibia, middle and lower thirds. Wm. L., aged 28; good health and habits; struck by locomotive. In addition to above injury, received compound fracture of skull. Limb put in fracture box for three days. Injury to soft parts limited, little oozing. On the fourth day put in fenestrated plaster extending above the knee; elastic suspension employed. Made a speedy recovery with no anchylosis. This is the first case where the splint was extended above the knee. No record of pulse and temperature kept

CASE 6. Compound comminuted fracture of left tibia and fibula, junction of middle and lower thirds. Male, aged 37; ship carpenter; good history; moderate drinker. Fell from a ship's chain, striking the injured limb upon another chain five or six feet below. Admitted to the hospital November 12, 1870. A piece of bone two inches in length, comprising the whole thickness of tibia, was removed, the wound of soft parts being one and a half inches by half an inch; subjacent tissues pouting and swollen; probe passes readily from one to one and a half inches in all directions; but slight oozing of blood; on the outer side of the limb, opposite the seat of fracture of the tibia, is seen an abrasion of the second and third degrees; limb shortened one inch. Dressing limb in fracture box caused great pain. Three days after injury placed in plaster splint extending above the middle of the thigh, and suspended by rubber tubing; fenestrum made of sufficient size to expose to view all integumentary injuries. Patient did well. Regular record of pulse, temperature and respiration was kept. The second day, November 13th, in the morning complained of chilly sensations, and pain at seat of outer contusion. Fenestrum enlarged. No evidence of suppuration found. The day following, faint fluctuation was felt at seat of contusion; about one-half ounce of laudable pus evacuated, exposing an opening leading to the fractured extremities of the fibula. Openings on fibular and tibial side communicate freely with each other. Seventh day, suppuration more profuse, pain increasing. Examination with a flexible probe showed a suppurating sinus extending upwards on the

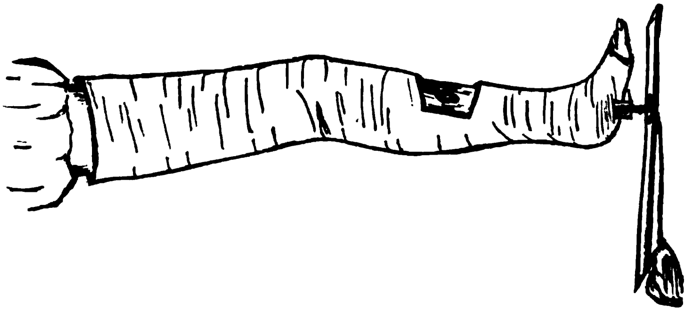


FIG. 8. PLASTER OF PARIS SPLINT WITH EXTENSION APPLIED TO FOOT.

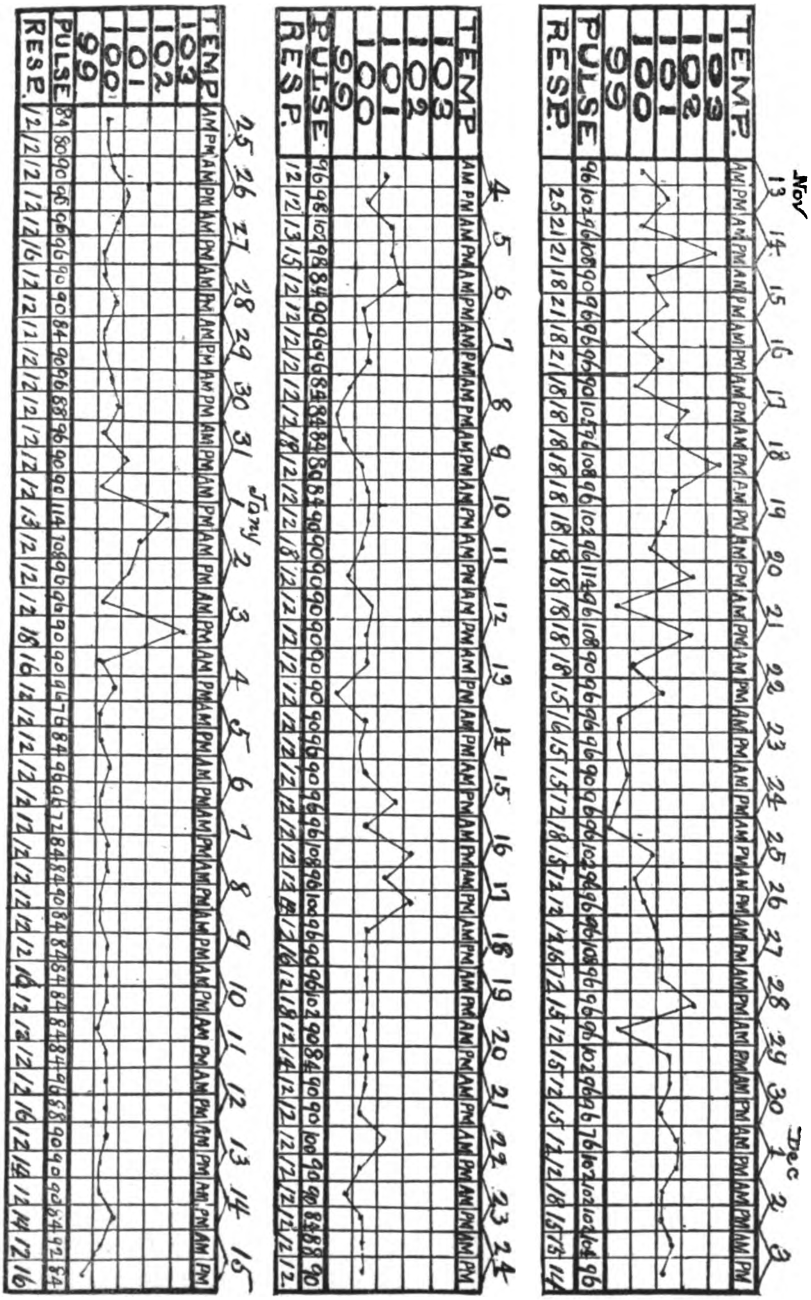


FIG. 9. DIAGRAM SHOWING THE VARIATIONS OF TEMPERATURE AND PULSE IN CASE 6.

outer side of the tibia, communicating with opening on the fibular side; fenestrum enlarged upwards the length of the sinus, the upper extremity of which was freely opened. Tenth day, complained of nausea; congestion of soft parts at fenestrum noticed, attended with some pouting; oakum was bound over the opening to remedy the evil. December 1st, twentieth day, partial union of fragments; suppuration free. December 2d, purulent discharge increasing. December 3d, fenestrum increased in size for observation of limb, swelling extending upwards. December 5th, small abscess opened two inches above the seat of injury to inside of the tibia. December 6th, feels much better. December 8th, compresses of oakum applied to sinuses and extension applied to foot of the splint. December 28th, for the last ten days has made no especial complaint; appetite improving; some tenderness of back; allowed to lie on his side, limb being turned in the swing, which afforded him much relief; new splint applied, with extension (five pounds) to the foot beneath the splint (Fig. 8). January 1st, since last note has progressed rapidly; changes his position daily, alternating from side to side; extension removed from limb; some union of fragments. January 2d, tissues upon fibular side somewhat inflamed. Bottle of whiskey found in his bed for his "New Year's" January 3d, headache, nausea, vomiting, wound doing finely. January 11th, been doing well till present date, sinuses closing. January 16th, splint removed, half inch shortening, union of bones well marked; ulcer corresponding to seat of injury. January 17th, new fenestrated splint applied up to knee; knee joint readily movable. From this point forward made a rapid and complete recovery without necrosis.

Remarks: This case is noticed to have been a very severe one. The extension of the splint above the knee rendered the fragments almost immovable, allowing the patient to lie upon his side, thus preventing bed sores.

It will be noticed that the extension applied to the splint caused excoriation of the heel as in a preceding case. The thermometer indicated quite accurately the beginning of suppurative processes. It would have been better, instead of keeping this case confined so long in bed, to have applied the fenestrated plaster splint firmly and gotten him up earlier. This patient might have made as complete a recovery if treated in a fracture box, but certainly not with the comfort to himself and ease to attendant.

CASE 7. Compound comminuted fracture of right tibia with extensive laceration of left leg, with simple fracture, becoming compound. Male, age 9. Injury due to direct violence caused by the falling of a large iron wheel against the anterior surface of legs, lacerating the soft parts and fracturing the bones. The wound of the right leg commenced three inches below the apex of the patella, was three inches in length, having a transverse diameter of an inch and a half; the muscular tissue was lacerated and protruding; small pieces of bone easily felt through the opening. Just below this, there existed a bloody thrombus the size of a hen's egg. On the left leg there was a large irregular crescent-shaped lacerated wound, beginning two and a half inches below the inner condyle of the femur, extending downwards transversely across the front of tibia to the fibular aspect of the leg, a distance of six inches in length and about four in width; no loss of tissue, but much swelling, attended by contraction of the lacerated flap; in addition to this, a transverse fracture of the tibia at the junction of the lower and middle thirds; no displacement. These extensive injuries have been thus carefully described to show that fractures with extensive lacerations can be put up in a plaster splint. In justice to the success attending the treatment of this case, it ought to be stated that it was deemed proper to amputate the right limb, and it was only with much reluctance determined to make an effort to save it. The splint was applied to the right limb twenty-one hours after the reception of the injury. It extended above the knee, and was strengthened by means of a posterior support. Fenestra and all dressings were made in accordance with descriptions heretofore given of the application of the plaster splint. The temperature was first taken twenty-six hours after the injury, when it was 104½° F.; pulse 128; no pain; toes numb and cool; circulation good. December 9th, no pain, swelling less, sensation and circulation normal, patient feels well. December 10th, beginning suppuration at compound fracture; fracture of left limb put in plaster to day; splint of the interrupted variety extending above the knee. December 13th, patient doing finely, splint painted with solution of gum shellac, one ounce to the pint of alcohol, to make it waterproof. The simple fracture of left leg became compound to-day through the medium of a small abscess. December 14th, wound suppurating, abscess incised in outer side of right leg. December 16th, progressing finely. From this time a daily record of events is unnecessary. In this, however, as in preceding cases, pulse and temperature were taken twice daily. The large laceration was healed by skin grafting. The left limb united without necrosis in the usual time. The right limb, before much union had taken place, was enclosed in a new closely fitting fenestrated splint, and the patient put on crutches. Recovery, with but a slight amount of necrosis, was secured. The successful issue of this case was no doubt largely due to the youth of the patient. The shellac covering applied to the surface of the splint prevented the entrance of discharges, although its application served, of course, to "repress the cutaneous exhalations,' etc., according to the first objection to the use of plaster.

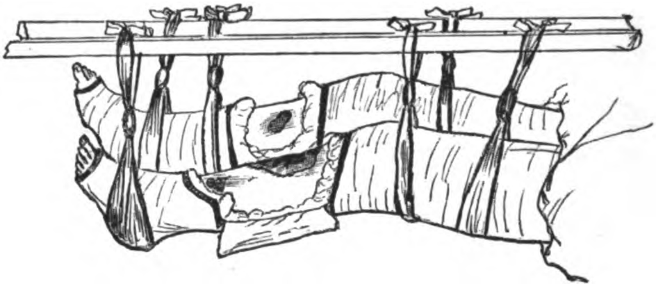


FIG. 10. METHOD OF DRESSING FOLLOWED IN CASE 7.

CASE 8. Compound dislocation of left ankle joint, complicated with Pott's fracture. Male, aged 58; constant drinker —"takes Rhein wine instead of water;" tongue and hands tremulous from loss of stimulants. Limb put up immediately, as in the preceding case. Wound did well for four days. Patient restless and sleepless during this time; then erysipelas developed; splint removed, limb placed in fracture box and poulticed; abscess formed, and patient died of pyæmia on the sixth day. This case rather illustrates the influence of previous habits on the prognosis, and teaches us to expect but little from patients of this kind.

Case 9. Compound fracture of right tibia and simple of fibula. General health good, moderate drinker; injury due to direct violence; wound of soft parts located two inches above ankle joint, anterior aspect, and is about an inch in diameter; tissues around emphysematous and distended with fluid blood, which oozes slowly from the opening; circulation of foot good. January 30th, put in plaster twelve hours after injury, after the usual method; lead and opium wash applied to wound; no pain; oozing nearly stopped; emphysema disappearing; wound sealed. January 31st, little pouting at fenestrum, oakum compress applied, otherwise no complaint; swelling rapidly disappearing, revealing slight tilting of the upper fragments. February 2d, the splint was sawn transversely through, tilting of fragments rectified, and splint repaired by adding new bandages at the side of section. This obviated the necessity of removing the splint to apply a new one, and met the indication admirably.

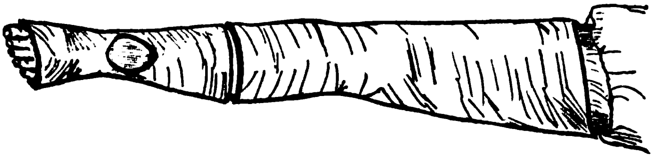


FIG. 11. SECTION OF SPLINT TO PERMIT RECTIFICATION OF TILTED FRAGMENTS.

This fracture became simple in three weeks after sealing, was then treated as a simple one, patient being out of bed on crutches. The emphysema and oozing seemed at first to render sealing of the wound impossible. However, the success attending the effort teaches us to make the attempt, notwithstanding unfavorable prospects of success. The amputation of the splint. and readjusting of the fragments

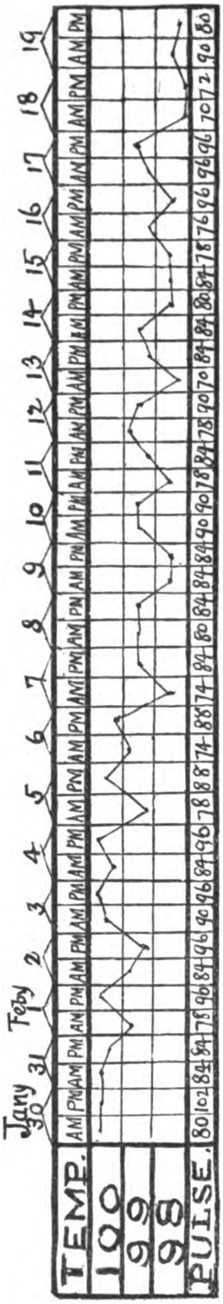


FIG. 12. DIAGRAM SHOWING THE VARIATIONS OF TEMPERATURE AND PULSE IN CASE 9.

teaches the ready manner in which plaster can be manipulated.

CASE 10. Compound fracture of right tibia and fibula; much laceration of soft parts at seat of fracture; comminuted fracture of left tibia. Male, aged 62; single; fracture of right leg at junction of middle and lower thirds; tissues much contused and lacerated; subcutaneous bloody effusion abundant; external hæmorrhage free; tibial arteries intact; fragments show a great tendency to displacement, yet reduced with much difficulty, the lower end of the upper fragment protruded one inch. Fracture of left limb, three or four inches above ankle, easily reduced. Injury caused by the falling of a hatchway door; limb put in plaster seven hours after the injury. January 31st, complained of pain in the limbs, which were allowed to lie on pillows, their position being often changed to give relief. Hæmorrhage considerable, checked by compress. Fracture imperfectly reduced. P. M., oozing slight, pain less. February 1st, more pain in limbs, which were swung this A. M., affording perfect ease. February 2d, blistering of tissue at fenestrum, due to ice—*i. e.*, cold and moisture, which has been removed; splint on left limb "cut up" and fenestrum of right enlarged; no pouting. February 3d, appetite poor, ice again applied, separated from limb by two thicknesses of dry lint and one of oiled silk. February 6th, splint on the right limb cut up for better observation. February 7th, limbs easy, fenestrum enlarged, and several superficial incisions made to obviate extension of suppuration. February 9th, feels much better this A. M., and limb is much improved. P. M., not so well; some pain. February 10th, feels good, but acts stupidly sleeping most of the time; suppuration rapidly increasing; edges of the wound look brown; is chilly; poultices of carbon, carbolic acid and oakum applied to wound. February 11th, feels much better, but tongue dry. February 12th, says he "feels well"; wound looks better; tongue moist P. M., slight chill, pulse feebler, breath saccharine, face sallow. rales in chest, respirations rapid; died late in the afternoon. No autopsy.

This case exemplifies well the changes for good and bad which may occur in pyæmic cases. To one not familiar with this eccentric disease, the changes for the better offer much hope—a hope which is quickly crushed in a day or so by the occurrence of a chill or some untoward symptom.

There was some doubt as to the practicability of attempting to save the limb, by any method of treatment, especially when the age of the patient, degree of the injury and probable effects of hospital influences were considered. The attempt was made, and no bad result followed which can be justly attributed to the influence of the plaster dressing. In this case blistering at seat of injury was particularly noticed, as well as a great tendency to pouting at the fenestrum. Cold and moisture excited the former, the latter was caused by œdema. If cold be long applied, the surface should be kept dry, especially if the patient be of low vitality. The application of ice to these injuries is to be made cautiously, and be governed largely by the condition of the parts and constitution of the patient. In old, anæmic and cachectic patients it must be used with great caution. Carbolic acid was given externally to forestall septic poisoning, which it did not accomplish in this case, nor is there any evidence that it exerted a beneficial influence.

This completes the list of cases which I shall present at this time. I have a number of others, which, like the ones already presented, serve, in my judgment, to confirm the belief that plaster of Paris is too important a factor in the treatment of compound fractures to be discarded. Moreover, if added, they would increase the length of this communication. I have also endeavored to show something of the period of inception, the growth and continuous improvements in its use. The first case of which any account can be found in the Bellevue Hospital Records has been detailed; from this to each succeeding one there will be noticed some change or suggestion which is the embodiment of an idea to add safety and comfort to the patient. The fatal and favorable cases have been given alike.

I have omitted to mention very many of the medical agencies employed in the treatment, not because they are not of the greatest importance, co-equal with the mechanical, but rather to emphasize the latter, and at the same time render this lecture as brief as practicable. The remedies are, however, those which will occur to all—those which support and nourish the patient, limit inflammation and sloughing of the injured parts and secure cleanliness and disinfection of the wound. My experience with the Lister dressing, in combination with the plaster bandage, is somewhat limited; however, such as it has been, leads me to assert quite positively that the combination of the two improves the results obtained by the use of either alone.

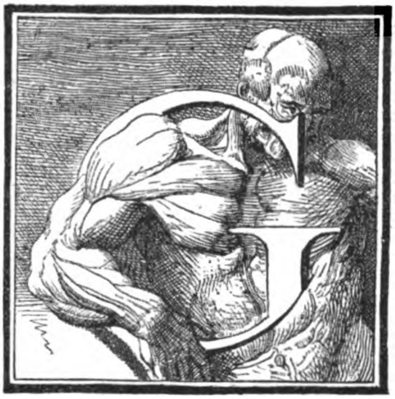
# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

## XV.—CLAUDIUS GALENUS (Continued).

A. D. 130—200.



GALEN was a prolific medical writer. A portion of his manuscripts, which were deposited in the Temple of Peace, together with others which were in his own house, were destroyed by fire; not a few have perished by the lapse of time, and yet the aggregate amount of his writings which have survived, and are now extant, is something enormous.

Curiosity has led me to make an estimate of the comparative bulk of Galen's writings with that of the sacred Scriptures, including both the Old and New Testaments. Making a careful allowance for uniformity in the size of type, measuring the length of lines, counting the number of lines on a page, calculating the space lost by incomplete lines in a paragraph Bible, and the same in the Greek edition of Galen (5 vols. folio, Venice, 1525), I find that the united lines of the Bible amount to three miles and two hundred and forty feet. The united lines of the works of Galen extend to sixteen and one-half miles. In both cases the text is taken exclusive of all headings, references, notes or commentaries—they stand as sixteen thousand feet to eighty seven thousand, Galen's extant works being nearly five and one-half times more voluminous than the entire Bible. What a mass to read! What a vast mass to have been copied and recopied, with the pens of patient and industrious scribes, for a period of nearly fourteen centuries! Who can duly appreciate the value of the printing press?

It is supposed that he wrote no less than five hundred distinct treatises. We now have existing and in print no less than eighty-three treatises written by Galen, the genuineness of which is now fully admitted. To these are to be added eighteen of rather doubtful origin; forty-five undoubtedly spurious; nineteen fragments, more or less extensive in size; and fifteen commentaries on the works of Hippocrates. To these printed works must be added forty or fifty treatises, or parts of treatises, which still exist in manuscript in the public libraries of Europe. Of the number of works which are lost, including about fifty on medical subjects, it is supposed that they amount to one hundred and sixty-eight. Galen wrote not only on medicine, but also on grammar, mathematics, logic, ethics, and other branches of philosophy. Galen was familiar with all the dialects of the Greek language, which enabled him to communicate freely with the people and the profession of every country through which he traveled for information. The greater part of his writings are in the Attic, though he sometimes employed the Latin, the Ethiopic, and the Persic, in which he was well versed. His style is elegant, but diffuse and prolix, and he abounds in allusions and quotations from the ancient Greek poets, philosophers, and historians.

As an example of the familiar style in which Galen relates his experience, records his cases, and sets forth his own claims to perception, tact, and skill, I will here introduce Dr. Watson's translation of a case from Kühn's edition of Galen,[1] the *Medical Profession in Ancient Times*, by John Watson, M. D., 8°, N. Y., 1856, p. 153–156: "Soon after my arrival in Rome, Glauco the Philosopher took a great fancy to me, in consequence of my reputed skill in diagnosis. Meeting me accidentally in the street and shaking hands with me, he remarked, 'I have fallen upon you opportunely. I wish you to visit with me a patient in this neighborhood whom I have this moment left—the Sicilian physician whom you saw walking with me some days since, and who is now ill.' I enquired of him what ailed his friend; when with his habitual candor he replied, that Gorgias and Apelas had spoken to him of my skill in diagnosis and prognosis, which appeared to them more like the result of divine inspiration than of medical science; and that he wished to know for himself whether I really was thus skillful. He had hardly done speaking before we reached the door; so that I had no opportunity of replying to his request—as I have often said to you—that on some occasions the signs of disease are certain, at other times they are ambiguous, and require to be considered again and again. But, as we entered, I observed a servant carrying from the sick chamber a vessel containing a thin bloody sanies, like the recent washing of flesh, a sure evidence of diseased liver. Without appearing to notice this circumstance, I proceeded with Glauco to the patient's apartment, when placing my fingers on the wrist of the sick man, I examined his pulse in order to determine whether the attack was inflammatory, or simply a weakness of the affected viscus. As the patient was himself a physician, he remarked that he had recently been up, and that the effort at rising might have accelerated the pulse; but I had already discovered the evidences of inflammation; and seeing on a recess in the window a jar containing something like a preparation of hyssop in honey and water, I knew that he had mistaken his disease for pleurisy; in which, as in inflammations of the liver, there is usually pain under the false ribs. He had been led to this opinion, as I at once perceived, by experiencing this pain, by his short and hurried breathing, and by a slight cough. Understanding the case, therefore, and turning to good account what fortune had thrown in my way, in order to give Glauco a high opinion of my ability, I placed my hands over the false ribs, on the right side of the patient, and at the same time declared this to be the seat of pain, which the sick man admitted to be correct. Glauco, supposing that I had made this discovery merely by examining the pulse, began to express surprise. But to increase his astonishment, I added: 'Inasmuch as you admit the existence of pain at this spot, I wish you further to say whether you are troubled with a slight cough, and whether your cough is not dry, without sputa, and occurring at long intervals?' While I was yet speaking, the sick man was seized with a cough such as I had described; whereat Glauco was exceedingly excited, and no longer able to contain himself, began to vociferate in praise of my abilities. 'Do not think,' said I, 'that these are all the discoveries my art enables me to make; there are others yet to be mentioned, which will elicit the testimony even of the patient.' Then turning to the latter, I resumed: 'Is not the pain in this part increased, and accompanied with a sense of weight in the right hypochondrium, whenever you take a full breath?' At hearing this the patient also was surprised, and was as loud in my praise as Glauco. Seeing fortune still smiling upon me, I was desirous of making some remark in reference to the shoulder, which appeared to be drawn downwards, as often occurs in severe inflammations as well as in induration of the liver; but I did not venture to speak on this point, fearing to diminish the admiration which I had already excited. Nevertheless I touched upon it cautiously, saying to the patient, 'You will not long feel the shoulder drawn downwards, if perchance you do not find it so already.' When he admitted this symptom also, seeing him greatly astonished, I said, 'I will add but one other word to show what you conceive to be the nature of your complaint.' Glauco declared he would not be surprised if I should do even this. But the patient, overcome with wonder at such a promise, observed me closely, waiting for what I should say. I told him he had taken his disease to be a pleurisy. This, with a further expression of surprise, he admitted to have been his opinion, as well as that of his attendant, who had been fomenting his side with oil for the relief of that disease. From this time forward Glauco entertained the highest opinion both of me and of our art; for, having never before come in contact with a physician of consummate ability, he had hitherto formed but an humble estimate of the profession. I have related to you these particulars," he adds, as if addressing a class of medical students, "in order that you may understand that there are symptoms peculiar to particular diseases, and others common to several diseases; and, further, that there are some symptoms inseparable from the disease, some usually accompanying it, others again of uncertain character or of rare occurrence; so that if fortune at any time offers to you a good opportunity, as in the instance just related, you may know how to take advantage of it; remembering that fortune often presents to us the means of acquiring fame, which, through ignorance, many are unable to turn to good account."

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[1] Vol. 8, p. 361. *De Locis Affectis*, lib. v., c. 8.

Excusing the conceit of our author, it is extremely interesting to listen to his fluent sentences which have come down through the long lapse of ages, as fresh and familiar as if spoken but yesterday. The methods of acquiring fame which he has here taught continues in use, and proves very serviceable to not a few of the modern disciples of Galen.

It is not within the limited scope of these "sketches" to attempt an analysis of all the works of Galen. I will hence confine myself to a brief notice of the more practical treatises, and particularly those which relate to anatomy and surgery. The treatise *De Usu Partium*, which is in seventeen books, and is preserved entire, written soon after his return to Rome, was not intended for a mere professional textbook, but was rather a dissertation on final causes, to disprove the doctrines of Epicurus, and to demonstrate the existence of a superintending Providence, as manifested in the marvelous adaptation of means to ends which the structure of the human body so admirably displays. It is full of anatomical detail and physiological opinions. It is here we find those hymns and pious ejaculations to the all-wise and omnipotent Deity — sentiments worthy not only of the heathen philosopher and moralist, but of the most devout worshipper of the Christian's God. While it would be obviously absurd to set up a high claim for the amount and accuracy of the anatomical knowledge possessed by the ancients in the time of Galen, as compared with that of modern times, yet it ought to be known that most of the descriptive terms both in physiology and pathology, as well as in anatomy, which are now in use, were employed by him in the same sense as they are employed by modern authors.[1]

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[1] Vide *Kidd.* A cursory analysis of the works of Galen, so far as they relate to anatomy and physiology. Trans. of the Provincial Med. and Surg. Asso., vol. vi, p. 299–336, to which I am much indebted.

Whether Galen's familiarity with practical anatomy was derived from human or comparative dissections, is an open question, but his familiarity with the dissecting-room and the physiological laboratory cannot be doubted. We find him directing the dissector, in examining the blood-vessels of the liver, to insert a probe into the "vena portæ," and from thence into any of its several larger ramifications; then gently advancing the probe further and further, to dissect down to it. And thus, he says, you may trace the minutest branches; removing with the knife the intermediate substance, called by Erasistratus the "parenchyma." He also directs the division of the cellular tissue by the finger or the handle of the scalpel. The blow-pipe and various other instruments and contrivances made use of in dissecting are described by this old master in anatomy.

Galen did not confine his observations to the dead body, but exhibited a remarkable degree of dexterity, boldness and originality in experimental anatomy. He observes that although a ligature on the inguinal or axillary artery causes the pulse to cease in the leg or in the arm, yet the experiment is not seriously injurious to the animal on which it is made, and adds, that even the carotids may be tied with impunity. As another evidence of his accuracy, we find him correcting the error of those less skilled in surgical anatomy, who in ligating the carotids failed to separate the contiguous nerves, and attribute the consequent loss of voice to the mere compression of those arteries, and not of the involved nerves. The term "peptic" he applies to the organs of assimilation. The nutritive portion of the food which is appropriated for conversion into blood he calls by the indiscriminate terms "chyme" or "chyle." We find the words *vena porta*, *esophagus*, *vena cava*, *uterus*, *brachialis internus*, *biceps flexor cubiti*, and many other anatomical names which are in use at the present day.

From frequent vivisections he observed that the pylorus acts as a valve *only* during the process of digestion, after which it relaxes; and but for this, he remarks, how would rings and coins of considerable size, etc., pass from the stomach to the intestines, as is frequently found to be the case? He speaks of "heart-burn," which he correctly says is due to an acrid sensation at the upper orifice of the stomach, adding, that no one who is acquainted with the writings of the ancients supposes that the term "cardialgia" signifies pain in the heart; for the ancients applied the term "cardia" to the mouth of the stomach as well as to the heart; in proof of which he quotes Thucydides, who, in his account of the plague of Athens, employs this word. Galen says, "cardia" was more anciently used for the mouth of the stomach than "stomachus."

Galen recognized the constitutional origin of local diseases, and points out the pernicious effects of unwholesome food and unhealthy chylification in the production of ulcers, and in retarding their cure. He observed that the process of digestion is completed in the intestines, and adds that the numerous convolutions of the intestines are to afford an extensive surface for the absorption of nutriment, which he conceived to be chiefly done by the veins. It is evident that he had observed the "lacteals;" for he remarks that in addition to the mesenteric veins which unite to make the portal vein, there are visible in every part of the mesentery other vessels proceeding from the intestines, which terminate in glands; he, however, did not comprehend their true function, as he supposed they were the proper nutrient vessels of the intestines. He ridicules some of his contemporaries for asserting that, upon exposing the mesentery of a sucking animal, several small vessels may be seen filled *first* with air, but *afterwards* with milk. It is probable that they had mistaken colorless lymph for air.

[To be Concluded.]

# EDITORIAL DEPARTMENT.

## THE TREATMENT OF SYPHILIS BY SUBCUTANEOUS INJECTION.

The history of this mode of treatment is short but interesting. and its latest developments instructive and promising for good. Scarenzio, of Pavia, was the first to employ this method, about 1854, using calomel suspended in glycerine (*Annales Universelles de Medicine*, 1864). His formula was:

Calomel—0 gr. 20 ctgr. to 0 gr. 30 ctgr.
Glycerine (or Mucilage, or Water)—1 gramme.
M.—For one dose.

One or two such injections caused the lesions to disappear, after eight to fifteen days. He published eight cases, with good results. except that, a few times, abscesses were formed.

Scarenzio's method was taken up, later on, in 1864-65, at the "Venereal Hospital" in Milan, by Dr. Ambrosoli, who fully corroborated Scarenzio's results. Later on, still in Italy, Riccordi, Monteforte, Soresina, and Bertarelli used the same, or similar, methods, with satisfactory results.

In Great Britain, Berkeley-Hill seems to have used, about 1866, injections of the corrosive chloride in eleven cases of Syphilis, with a dose of one milligramme, and with good results. If the dose was increased, abscesses at point of puncture, salivation, colic and diarrhœa, were often found.

Lewin, at "La Charité" in Berlin, experimented in 1868 on a grand scale, using the corrosive chloride dissolved in water at a dosage of 5 to 10 milligrammes, adding morphia in some cases to make the injection less painful. His average number of injections was sixteen for each patient, and the average total quantity of the sublimate was 15 centigrammes for each. Results good.

M. Hardy tried the Berkeley-Hill and Lewin method on some patients at "L'Hôpital St. Louis" in Paris, but gave it up on account of the severe pain, abscesses and eschars resulting from the injections. Diday, moreover, had the same results. Quite a number of physicians followed up the method during 1868-69 ; some liking it, others opposing it.

Liégeois communicated his results to the Paris "Society of Surgery," at its meetings held on June 2d and 9th, 1869. His formula was as follows :

Distilled Water—90 grammes.
Sublimate—0.20 ctgrms.
Hydrochlorate of Morphia—0.10 ctgrms.
M.—To inject 1 gramme.

That is rather more than 2 milligrammes for each time ; he found no inflammatory re-action at the wound. In two cases only, a slight eschar followed. The pain was insignificant ; four cases of slight salivation occurred in one hundred and ninety-six patients. Each patient had two injections every day. Average length of treatment, thirty-seven days, and relapses was noticed in 37½ per cent. He thought that the drug cured much more rapidly than if administered by way of the mouth. Liégeois advised the employment of this treatment in preference to all others, claiming that patients were perfectly competent to use the method themselves, without coming every day to the surgeon.

Aimé-Martin presented his method to the "Society of Medicine" of Paris, on the 7th of August, 1868. He prefers a formula like the following :

Double Iodide of Mercury and Potassium—0.40 centigrammes.
Muriate of Morphia – 0.05 centigrammes.
Distilled Water—10 grammes.
M.—Inject 10 drops every other day.

The morphia to be added at moment of injection, to avoid precipitation. Martin reports his cures as rapid and free from local lesions.

Bricheteau (*Bulletin de Thérapeutique*, 1869) uses this formula :

Double Iodide of Mercury and Sodium—1 gr. 50 centigrammes.
Distilled Water—100 grammes.
M.—5 to 10 drops as an injection, once or twice a day.

1 gramme contains 1 centigramme of the mercuric salt.

Belhomme employs this formula :

Double Iodide of Mercury and Morphia—0 gr. 50 centigr.
Distilled Water—20 grammes.
M —5 to 10 drops once a day.

Bouchardat mentions (1872) the following solution (of Staub):

Corrosive Chloride—1 gr. 25 centig.
Ammonium Chloride—1 gr. 25 centig
Sodium Chloride—1 gr. 15 centig.
White of Egg—No. 1.
Distilled Water—250 grammes.
M.—

This is a great advance, and the mixture is called "Solution of the Chloro-Albuminate of Mercury" by its inventor.

Quite recently Mialke has shown that subcutaneous injections of the corrosive chloride of mercury cannot be absorbed, except when the metallic salt acts upon the albuminous contents of the connective-tissue spaces, and produces, at their expense, an "albuminate of mercury," which is easily absorbed. This coagulation in the connective-tissue is the principal cause of pain, of formation of inflammatory nodules. or even of the sloughs we sometimes find. It is, therefore, reasonable to form the "albuminate of mercury" outside of the body, and avoid these annoyances (Terrillon "*Bulletin de Thèrapeutique*," 4th, 5th and 6th parts, 1880).

The thesis of M. Cotte (Paris, 1873) may be referred to for interesting details on this point. This advance was not appreciated, and our journals are full of accounts of accidents following these injections. Nevertheless, the art advanced, and surgeons sought after new compounds; thus, Cullingworth used the bi-cyanide in glycerine and water; Sigmund also advised a similar formula; Aimé-Martin used the double iodide of mercury and potassium in the formula already given.

At last, Bamberger used chemically pure peptone in combination with mercury. Martineau, in his excellent article, which I am using so freely ("*Union Medicale*," No. 99, et seq., 1881), does not say how to prepare his "peptone de viande" (it is erroneously printed "pepsine de viande," which is nonsense), but Catillon ("*Repertoire de Pharmacie*" quoted by "*Druggists' Circular*," January, 1881), uses this formula:

Lean Beef, minced—2 pounds.
Hydrochloric Acid (sp. gr. 1.18)—5 drachms.
Water—10 pints.
Pepsine—sufficient.

Digest 12 hours at 45°C. with slight excess of pepsine. Keep temperature between 43°C. and 48°C.; agitate from time to time, and after two to six hours the mixture is nearly transparent. After 12 hours strain and filter. Saturate with bicarbonate of soda, and evaporate on water-bath till a pellicle forms on its surface. It then has, when cold, a sp. gr. of 1.15, and contains one-half of its weight of solid peptones.

Bamberger's formula was this:

Having made a solution of the sublimate in water of 5 per cent., and one of chloride of sodium of 20 per cent., he dissolved 1 gramme of "meat peptone" in 50 cubic centimetres of distilled water, and filtered it. He then adds to this last 20 cubic centimetres of the mercury solution, and after well mixing he adds just enough of the sodium chloride solution to dissolve the precipitate of peptonate of mercury, the amount required being about 15 to 16 cubic centimetres. Then add to the solution of "mercuric peptone" enough distilled water to make up 100 cubic centimetres, thus making it just one per cent. mercury—that is, 1 gramme of the solution represents 1 centigramme of the sublimate, about one-sixth of a grain. The solution is fit for use after settling some days, decantation and filtration. The dose is 1 cubic centimetre every three or four days; if oftener repeated, abscesses and salivation are to be feared.

Zeissl and Neumann, of Vienna, and Von Rinecker, of Würzburg, have used Bamberger's formula. Terrillon (op. cit. supra) used it also during his earlier experiments. Later on he used the following formula:

Biniodide of Mercury—1 gramme.
Potassium Iodide—1 gramme.
Tribasic Sodic Phosphate—2 grammes.
Distilled Water—up to 50 cubic centim.

Both formulæ have produced some local lesions, painful nodosities, more or less persistent indurations, but no serious troubles like abscesses or sloughs. Other preparations, the lactate, phosphate, acetate, and biniodide of mercury have been used, but no more successfully than those already noted.

Martineau, of the "Hôpital de Lourcine," has, since the 12th April last, used the following formula:

Bichloride of Mercury—10 grammes.
Peptone de Catillon, dry.
Chloride of Ammonia, C. P. of each—15 grammes.

1 gramme contains 25 centigrammes of the sublimate.

This formula has given best results, because the Catillon peptone is exceptionally fine and pure; and since pure muriate of ammonia is the best solvent of albuminate of mercury which is so easily precipitated, it has also been found best to let the peptone be in excess slightly.

The following solutions have proved excellent :

Solution (A).

Ammoniated Mercuric Peptone—0 gr. 40 centig.
Distilled Water—30 grammes.
M.—This contains 4 milligrammes of sublimate in 1 gr. 20 centig., and will keep well for several days.

Solution (B) is more stable.

Mercuric Peptone (as above)—0 gr. 40 centig.
Distilled Water—25 grammes.
Neutral Glycerine—6 grammes.
M.—Dose and strength same as (A).

Solution (C) appears entirely stable.

Mercuric Peptone—0 gr. 40 centig.
Glycerine, C. P.—36 grammes.
M.—Same dose and strength as (A) and (B).

Since 12th of April Dr. Martineau has treated 51 patients; the total number of injections up to June 21, 1881 (the date of his paper), is 751.

Series 1 consists of those who had 1 milligramme of mercury injected every three days.

In series 2 the dose was raised to 2 milligrammes every three days.

Series 3, 2 milligrammes every two days, and series 4 every day.

Series 5, 3 milligrammes every day.

Series 6, 4 milligrammes every day, and finally, series 7, 5 milligrammes every day—the last only since June 21, 1881, but is well supported, no pain, no local inflammation and no mercurialization. He still proposes to go up to 6, 7, and 8 milligrammes per day, the result to be noted in another paper.

At the séance of the "Academie de Médicine" of Paris, on August 9, 1881, Dr. Martineau, in reply to questions, said that he had gone as far as 6 and 7 milligrammes of the sublimate every day, and had now used 1,300 injections, and yet never has had any salivation, although the mercury was freely eliminated by the kidneys, as shown by constant tests. He finds any local irritation very unusual, and prefers, as place of injection, the back, the sides of thorax, and some of his patients have had up to 45 injections, still without the least local accident. He finds the method superior to all others, especially in cases of severe syphilis, with serious symptoms in rapid evolution, and even up to 6 or 7 milligrammes per diem he has almost never pain, no abscesses or gastro-intestinal irritation, and rapid amelioration of symptoms. He justly remarks that it is yet too early to definitely pronounce upon the probability of relapses. Martineau's cases are highly interesting and valuable, but space will not permit their reproduction here. It is curious to note how rapidly the worst syphilitic accidents have disappeared under the hypodermic treatment, and in most cases without irritation or pain. It is very much to be desired that some American syphilographer should reproduce Martineau's experiments on a large scale in a hospital, as, under such circumstances, the method presents many incontestable advantages, even if it be not as well adapted to private practice. N. B. SIZER.

# PYÆMIA AND SEPTICÆMIA. THEIR CAUSES, DIAGNOSIS AND METHODS OF TREATMENT.[1]

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TO the operating surgeon nothing possesses a greater interest than the two diseases which have been selected for discussion this evening. In the experience of most of us gathered here to-night this subject brings up recollections of frustrated hopes, of untimely graves, of surgical skill carefully exercised, but of no avail. When we have lost some case which bid fair to recover, we have all doubtless searched the literature of the subject for a more keen insight into the causes which brought about our disappointment, and with regret have been forced to confess our search unsatisfactory, and our minds befogged by conflicting statements. It is not uncommon to find the terms "pyæmia" and "septicæmia" used as synonyms[2] both by professional brethren and by standard authors; and, if any distinctions are drawn, we are apt to find the basis rather one of degree than of pathological conditions. Respecting this point, Callender very wisely says: "It is to be regretted that surgeons have not limited the term pyæmia to the class of secondary deposits traceable to mechanical causes. Now, that the term is held to include all cases of septic or puriform infection arising in the course of surgical injuries or diseases, it is loosely named as the cause of death in many cases, and surgeons differ widely in their experiences of a disease which admits such elasticity of application." Of late our daily papers have poured into the public ear long dissertations upon this subject—in relation to a case which was then exciting the most universal interest—and it is to be hoped that many of these did not directly or indirectly spring from professional sources. I have examined with some care the latest articles upon this subject, and most of those which have been incorporated in the more exhaustive treatises upon surgery—and I cannot but feel that in none to my mind is the subject so stated as to present what is known in its simplest form or to bring out those finer distinctions between these two diseases which I believe future investigation will sustain. With this short statement of my reasons, I will ask your attention to what I believe to be the essential points of difference between pyæmia and septicæmia, and the measures of relief which offer the best prospects of success in treatment.

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[1] A lecture delivered before the Anatomical and Surgical Society, of Brooklyn, N. Y., October 17, 1881.

[2] The term "systemic infection" is used by some authors as a synonym for septicæmia, while others employ the same term to cover the two conditions here discussed. It is this uncertainty in the use by authors of the names "pyæmia," "septicæmia" and "systemic infection" that tends to confuse the reader as to the pathological conditions of each and the distinctions to be drawn as to their symptoms and morbid anatomy.

## MORBID ANATOMY.

SEPTICÆMIA is a condition unquestionably dependent upon a blood poison. It may occur whenever *decomposing animal matter* is brought into *direct contact with living tissue*, and then only. It is due to the direct absorption of such decomposing animal matter; and the intensity of the attack as well as the question of its results and duration depend absolutely upon the quantity absorbed. I believe that the *lymphatic vessels* are the vehicles in this case for the introduction of the poisonous material into the general circula-

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tion, and that the blood vessels are not directly concerned in the process. The effect of this type of blood poisoning does not seem to show itself in local points of suppuration—the so called "metastatic abscesses"—nor are infarctions found in the viscera. The patient may die within twenty-four hours, if the poison be introduced in large quantities; but, if small quantities are gradually introduced into the blood, the condition may resemble a continued fever and recovery take place, if the infecting material be thoroughly removed in time. We have an admirable example of the conditions necessary to produce this condition in a case of retained placenta. Here the living tissue is found in the uterine walls; the decomposing animal matter in the placenta, which is no longer nourished; the actual contact between the two is ensured, and the absorbent vessels are here abundant.[1] The woman develops a fever after sufficient time has elapsed for the transmission of the infecting material to the general circulation, without any concomitant symptoms of local or general peritonitis; and possibly dies if the placenta is not hastily removed, in which case a gradual return to the normal condition is the rule.

We see equally favorable conditions for the development of this disease exhibited (1) in all sloughing wounds, bed sores, etc.; (2) in gangrene, either of the extremities or of the viscera—especially in the lungs; (3) in large abscesses where the pus has decomposed—usually from the presence of openings admitting air; (4) when a dead fœtus is retained in the womb; (5) during an attack of diphtheria, when the sloughs are "in situ"; (6) in typhoid fever when the ulcers are covered with sloughing tissues; (7) when the bladder contains decomposing mucus mixed with residual urine;

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[1] Mackensie claims—*Med. Chirg. Trans.*, vol. xxxvi—that the presence of lactic acid, if introduced into the blood artificially, may generate pyæmia, and he regards this as one of the possible conditions of the puerperal state when followed by evidences of blood poisoning.

(8) when dissecting wounds are received; and (9) in many other similar conditions where tissues which are placed in contact with decomposing animal material are abundantly supplied with lymphatics.

The result of this form of blood poisoning seems to be evidenced by a diminution in the normal power of coagulation and by a dark color of the blood. The clot (in case any forms, after blood is drawn from the patient) is soft and breaks down easily; and the blood furthermore exhibits evidences of rapid decomposition when drawn from the body.

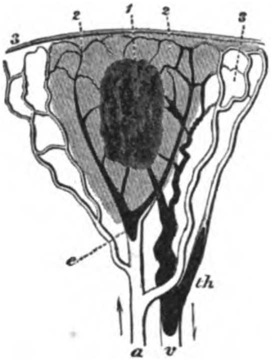
After death the salivary glands will often be found to be enlarged. The liver will be engorged with blood and appear œdematous, and the spleen will be softened. The heart will appear flabby; and all of the mucous membranes will be congested, relaxed and softened. There will be, however, *no evidences of metastatic abscesses or infarctions of organs*, and this, to my mind, is the characteristic pathological distinction between this disease and pyæmia.

During life, the jaundiced hue of the skin which is so common in pyæmia is less marked or absent.

Let us now hastily review the morbid anatomy of the affection so closely allied to septicæmia.

PYÆMIA may occur not only when open wounds are present, and the conditions for absorption are fully developed, but also when no conditions which are favorable to the absorption of poisonous material can be detected. Thus we are forced to recognize two forms of the pyæmic condition, one of which is associated with an open wound or granulating surface, while in the other no open wound exists. In both of these forms we find *metastatic abscesses* of organs, tissues, or joints, after death, and, during life, the characteristic phenomena of pyæmia. In order to properly grasp the full details of the pathological changes in each of these two forms, it will be necessary to hastily review the morbid anatomy of infarction and metastatic abscess; since the latter usually occurs in the centre of an infarction as the result of its disintegration.

An *infarction* is a wedge-shaped spot of consolidation and discoloration within an organ dependent upon occlusion of a blood vessel and the subsequent rupture of neighboring capillaries. Whenever a vessel of an organ becomes occluded, the parts nourished by the occluded vessel are deprived of blood, until a collateral circulation is established. Now, it is found that, after such occlusion, the parts which are at first deprived of blood become subsequently the seat of a rupture of the *capillary blood vessels* as the result of an excessive pressure produced by the collateral fluxion. Hence the infarction is wedge-shaped, as a rule, owing to the distribution of the blood vessels; and its apex (corresponding to the seat of the plug) usually points towards the centre of the organ in which it is detected. These infarctions are very frequently met with, and



A DIAGRAM OF AN EMBOLIC INFARCTION. (*After Weber.*)

*a.* Artery obliterated by an embolus (*e*). *v.* Vein filled with a secondary thrombus (*th*). 1. Centre of the infarction, which is becoming disintegrated. 2. Area of extravasation of blood into the tissues. 3. Area of collateral hyperæmia.

especially so in the lungs, spleen, and kidneys. If the circulation is not speedily restored, the result of defective nutrition caused by the embolus is evidenced in one of three ways: either in *gangrene*—if the part be totally cut off from its blood supply; *fatty degeneration* and *absorption* of the embolus and blood coagula—if the nutrition be only partially cut off; or more or less extensive *suppuration*—if the plug in the vessel be derived from a suppurative focus or be septic in its origin. We usually find, therefore, that old infarctions are liable to appear pale, and to be firm and incompletely organized, provided that the character of the plug (an embolus or thrombus[1]) does not create suppuration; in which case disintegration takes place rapidly in the center of the infarction, and an abscess results—"embolic abscess."

The more complete the obstruction the more vascular the tissue, and the less the vessels are supported the greater is the amount of infarction and the more rapid the softening and disintegration that ensues (Green's Pathology). Now I ventured to assert that the development of "*metastatic*" or "*embolic abscesses*" is the distinctive pathological feature of pyæmia, and that no case can be properly so called when these abscesses are not found after death. It devolves upon me, therefore, to explain the mechanism of the production of suppurating infarctions in the two forms of pyæmia previously described.

In pyæmia, if developed in connection with an open wound or granulating surface, I believe that an abnormal blood condition is developed; usually as the result of a miasm which is generated only in *decomposing pus*. If we accept either of the two prevalent doctrines—that pus is largely the result either of the transudation of white blood corpuscles—doctrine of Cohnheim—or of the proliferation of connective-tissue cells—doctrine of Virchow—we cannot find ground for the belief that pus alone,[1] when healthy, is capable of producing disease. The experiments of the older authors as to introduction of pus into the blood are now worthless as data for conclusions, since the pathology of pus formation was not then understood.

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[1] I use these two terms in their proper acceptation. The term "embolus" covers all clots or foreign bodies in the circulation which are either moving with the current, or which, if stationary, have previously been transported by the blood to the seat of existing impaction.

The term "thrombus" covers only blood coagula, which are found within the calibre of a blood vessel, and which have *been formed at the point* where they tend to partially or completely occlude the vessel.

Decomposition of pus, however, brings in an element of danger which seems to carry contagion. All of us here to-night have doubtless seen a hospital ward suddenly become a pest-house when a pyæmic subject has been once introduced into it; and, in spite of all measures, patient after patient will die, and reveal pyæmic abscesses at the autopsy. Such wards retain this capability of infection, even after the most thorough fumigation and the removal of all patients, furniture, and also often of the windows, for months.

Such facts in themselves indicate the presence of a miasm, whose nature we do not, perhaps, fully understand—any more than we do that of each of the eruptive fevers—but whose starting point seems, without doubt, to be in decomposing pus. It would exceed the limits of this paper to discuss the pros and cons of this subject; but I believe that little exception can be taken to the statement.[1]

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[1] It is hardly necessary to-day, in the light of recent investigation, to dwell upon the theories of Gendrin, Gluge, Vogel, or the famous experiments of Sedillot, as to the action of pus upon the blood when artificially introduced, since the views of Cohnheim, as now accepted, place pus corpuscles and the white blood corpuscles as identical structures. To what extent the investigations of Dance, Donné, Sedillot, Majendie, Gaspard, Cruveilhier, and others, exhibit points of agreement or contradiction, may be attributed to the *condition of the pus injected*, since no two of these arrived at absolutely the same conclusions. Hughes Bennett has shown that the condition of leucocythæmia—where the white blood corpuscles are in great excess—favors the development of pyæmia; and it is also claimed by Callender that all conditions which seem to predispose to the pyæmic condition are likewise associated with a relative increase in these corpuscles. It is absurd, therefore, to claim, even if we disregard the physiological processes which we know create variations in the corpuscular elements of the blood, that the discovery of an excess of white corpuscles in the blood of a patient is to be construed as evidence of the absorption of pus.

Now, what becomes of this miasm and what are its results?

I believe, in the first place, that the miasm, so generated in decomposing pus, is *directly absorbed by the blood vessels*, and not by the lymphatics, as was the case with septicæmia.

In the second place, there seems to me but one way to account for the metastatic abscesses which follow its introduction into the blood—viz., to attribute to this miasm the property of creating in the blood of the infected a tendency toward *spontaneous coagulation* in the smaller vessels where the *current becomes extremely slow.*[2]

In this way, a tendency to local obstruction in the small vessels is produced — and these plugs are properly "thrombic" in their nature, since they are formed at the seat of capillary occlusion; hence infarctions are subsequently formed from extreme collateral pressure at the seat of each obstruction, provided the vessels anastomose freely. Now, the clots which thus occlude the blood vessels are the direct result of a septic influence, and they are, therefore, septic in character; therefore a secondary suppuration occurs in the region of each thrombus and its accompanying infarction, resulting in an abscess.

It is quite possible for an open wound to generate the pyæmic condition by another process—which will be described later on, in connection with the second form of pyæmia—in which case miasmatic influences may be absent;

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[1] Desault endeavored to trace the condition of pyæmia to some disturbance of the nervous centres—a view entertained by that author from certain observations made by him on secondary affections connected with injuries to the skull and its contents. It is safe to assert that our present enlightenment as regards the results of suppurative phlebitis and thrombosis of the cerebral sinuses effectually overthrows this theory.

[2] This view is sustained by Bouillaud—*Archives générales de Médicine*—as well as Bouchut, since they state that the blood in these cases, whatever the condition may be, shows a tendency to coagulate during life on the slightest provocation, and then to undergo other changes.

but I question if this mode of origin is not the exception rather than the rule in the case of open wounds. As this method of development—emboli developed from a "suppurative phlebitis"—will be considered in detail in its relation to those cases of pyæmia where no open wound exists, it is simply mentioned in connection with open wounds or granulating surfaces as one of the possible methods of origin when no decomposing pus seems to have existed as an exciting cause of the disease.

The second form of pyæmia need not *necessarily* be associated with a wound or a denuded surface. It is always dependent upon some constitutional debility, and is usually caused by some form of traumatism sufficient to excite a local phlebitis.[1] Were it not for the fact that phlebitis is usually of the healthy or "adhesive" type in the strong and vigorous,[2] and that the blood coagulum formed in each vein tends to permanently occlude the vessel, and to become organized rather than to disintegrate, the development of pyæmia after such an inflammation, would be of common occurrence.

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[1] The investigations of Dumas, tending to prove the association of changes in the lymphatic vessels and glands with the secondary changes of pyæmia, are not sustained by the latest pathological observations, nor did his theory ever have many supporters. In the same list may be also classed that ingenious but unsustained theory of Fingers, that, after the removal of some organ, as the testis, pyæmia is generated by the action of some retained material which was destined to be employed in the performance of the normal functions of the removed part.

[2] The pathological changes which occur in the veins, and with which I believe many of the cases of true pyæmia are associated, were pointed out early by Gulliver—*Med. Chirg. Trans.*, vol. xxii—and they have received a marked confirmation in the researches of Bristowe, Callender, Virchow, and others. The case of a man who died four months after a fracture of the femur, and who revealed extensive coagula in the veins of the thigh—reported by Callender—illustrates the fact that open wounds are not essential to the formation of an extensive thrombosis. A similar case is reported in the St. Barthol. Hosp. Reports, where a man died on the twenty-sixth day after an injury to the scalp; at the autopsy there was found extensive thrombosis of the superior longitudinal sinus, and metastatic abscesses of organs. It was first noticed by Cruveilhier that secondary abscesses are especially prone to follow injuries to the bone structures, where the veins neither collapse after division nor tend to shrink firmly upon the clots which form within them. I quote the following sentence from Callender respecting this point:

"It is now known that the lining membrane of veins rarely presents evidences of inflammation; that it probably never secretes pus, and that the appearance of suppuration noticed in these vessels is in truth caused by softening clots."—Article in *Holmes' Surgery*, vol. i.

It may be a digression from the strict line of argument to here recite two cases which brought to my mind most forcibly the facts whose mechanism we are now to consider. Twice, in my own experience, has a case of contusion of the scalp—without laceration—been followed by apparent convalescence, when a severe rigor, fever and sweat has occurred again and again till death ensued. Metastatic abscesses were found at the autopsy of each, and the condition of pyæmia unquestionably had developed. Now, how are we to explain this condition? I do so as follows:

These patients were both addicted to alcohol and in poor physical condition; hence admirable subjects for suppurative inflammation. The contusion unquestionably excited a phlebitis of the diplöe, which was accompanied by the usual clot-formation, but which assumed, on account of the condition of the patient, the *suppurative type*, and thus was followed by disintegration of the blood-clot. By this means floating particles of coagulated blood were washed into the general circulation, and, meeting vessels of steadily increasing calibre, they easily reached the right heart, and were thrown from the right ventricle into the lungs.

Those particles which were too large to pass the pulmonary capillaries became the cause of embolic obstruction in the lungs themselves. Those that succeeded, from their small size, in passing through the lungs, gradually accumulated fibrin from the blood-plasma until they reached a sufficient size to cause them to be arrested in other organs or tissues. Now, as before shown, infarctions were thus created at the seat of each arrested embolus, and again suppuration was at once established in each infarction, since the embolus was of suppurative origin and, therefore, septic in its effects. We can thus account for the metastatic abscesses in the centers of each of the numerous infarctions, produced by the original particles which started from the veins of the diplöe. But the process does not cease, it starts anew when each infarction suppurates, sending forth new particles from the disintegrating coagula of each infarction, and thus multiplying abscesses in other remote parts. If the patient should live long enough, there would be practically no limit to their number, and no portion of the body would escape them.

It is such cases as these that tend to impress upon us the important clinical distinction which should always be made between an adhesive and a suppurative phlebitis. The former occurs in the robust subject, and its results are confined to the simple occlusion of the inflamed veins; the latter, on the contrary, never occurs in the healthy subject, tends toward an extension of the inflammation from small to large venous trunks, is accompanied by suppuration and disintegration of the thrombus formed within the inflamed vein, and endangers the life of the patient by creating infarction and metastatic abscess of organs—in other words "pyæmia."

The cases cited by me were those of injury to the cranium, and such cases are especially liable to be followed by a phlebitis, as the veins of the diplöe are usually inflamed to a greater or less degree by any contusion over the cranial vault, but this method of origin of pyæmia need not be confined exclusively to such cases. Any open wound may be accompanied by a phlebitis of the injured part, and so may a contusion of any region of the body, even when no wound exists. Pyæmia need not, therefore, be always due to miasmatic influences, even when a large open wound exists, since, in spite of all local and sanitary precautions, a suppurative phlebitis may be generated within the injured part and the patient's life be sacrificed in spite of all surgical precautions. In this pathology of pyæmia I differ somewhat, but not in essential points, from the latest views advanced. A careful study of the cases which have fallen under my personal observation, as well as a close analysis of the views of others whose experience has been more extensive, tends, however, to daily confirm my convictions. Time will not permit me to strengthen my position by a long array of dry facts and statistics, so I leave my views to you for respectful consideration and pass to the symptoms of the two diseases.

## SYMPTOMS.

These two diseases have a list of symptoms which closely resemble each other, although I believe that certain distinctions may be drawn which will help the practitioner to distinguish them during life. Of course, the etiology will often prove a most important factor in the diagnosis, and a prevailing epidemic of pyæmia in a hospital or the history of a positive exposure of the patient to this miasm would also be of the greatest significance. As has been shown in previous pages of this paper, the absence of a wound does not preclude the possibility of pyæmia, since the lungs may unquestionably act as a means of transmission of the pyæmic miasm; while the existence of a suppurative phlebitis does not necessarily depend upon an open wound,[1] although often associated with one. It must be also borne in mind that the two diseases may possibly co-exist, since there is nothing remarkable in a suppurative phlebitis being developed in connection with a general systemic infection from decomposing animal matter, nor is it beyond the bounds of possibility for the blood to be affected by two distinct conditions at the same time. We frequently see scarlatina and diphtheria co-exist, and yet no authors now claim that the two diseases are identical in their pathology or symptoms. It will help us in our study of the symptoms of these two diseases, to review first those of pyæmia, and subsequently to mark such points of distinction as may be safely regarded as especially diagnostic of the condition designated as septicæmia.

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[1] A case is reported by Tweedy where pyæmia followed a blow upon the thigh. Lee also reports a similar result from a contusion over the patella. Savory and Bristowe furthermore support this position, and thus sustain the embolic theory.

Pyæmic patients are attacked with a more or less violent fit of shivering,[1] which may have been preceded by no premonitory symptoms, but which usually follows a diarrhœa, a hemorrhage, some form of diffuse inflammation, an erysipelas, a phlebitis, or some form of injury. There is a general trembling and chattering of the teeth, the limbs are usually brought close to the trunk, and the surface temperature apparently falls, but actually rises in some instances. It becomes difficult for the patient to converse during the chill, and the speech is short and interrupted. The countenance is of a leaden or yellowish color, resembling that of approaching jaundice, and indicates to the physiognomist a sense on the part of the patient of great impending danger. All of the features seem small and contracted. The pulse becomes soft, rapid, and small in volume. In a longer or shorter space of time, varying from ten to fifty minutes, the surface temperature becomes elevated above the normal point—varying from 102°–105°[2]—and a stage of tranquil perspiration follows the fever.

As the case advances, the fits of shivering recur; sometimes with perfect regularity, following the hour of the first chill, while, in other cases, the course of the chills is erratic. The same fever and sweat, as at the onset, follows each attack of shivering to a greater or less degree; the wound (if present) gradually shows evidences of unhealthy action in the character of its granulations and its discharges; the patient seems exhausted by fatigue and develops the "*coma vigil,*" with occasional periods of delirium, or passes into a deep stupor; the respirations tend to become shorter and more frequent; the inspiratory efforts are labored; gradually the breath acquires a sweetish or purulent odor; the joints often become the seat of suppuration, and fluctuate; the skin grows yellow, as if jaundiced, and day by day this discoloration deepens; finally, the sufferer often cries out with painful cramps in the side, distress in the calves of the legs, or articular pains.

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[1] After operations, the symptoms of pyæmia may commence at any time from the second day to the third or fourth week.

[2] The temperature of pyæmia seldom exceeds 104°, and commonly presents distinct fluctuations.

Between the fourth and eighth day,[1] in a typical case, the evidences of the protracted struggle reveal themselves in the dull eye, the cornea of which has lost its lustre; the tremulous and rapid pulse; the development of subsultus in the arms and legs; the loss of power of the bladder, which fails to empty itself; a peculiar weakness of the voice approximating true aphonia; a dry tongue, with the lips and teeth encrusted with sordes; and an extreme emaciation of the body. Certain vague types of paralysis are occasionally developed during the latter stages of this disease. The lungs often exhibit the physical signs of an existing bronchitis or pneumonia; and the vesicular murmur is indistinctly heard as the air seems to be carried with difficulty to the alveoli. There is often pain about the head, and the patient, restless and irritable, fails to obtain accustomed sleep.

When any special portion of the body becomes the seat of local lesions, new symptoms usually arise which tend to point toward the part especially involved. If the nervous centres are implicated, delirium, rarely of a violent character, is often developed in connection with pain in the head, and the patient tends to grow heavy and drowsy, answering questions only when aroused, and then with indistinctness and some hesitation. Lesions of the thoracic organs are indicated by cough, dyspnœa, hurried respiration, pleuritic and pericardial pains, and often by a sense of weight in the region of the heart. An increase in the jaundiced condition of the skin and sclerotic, with hepatic tenderness, point to the liver as the seat of probable changes, and this is furthermore indicated when the patient develops a diarrhœa with copious bilious evacuations, as well as by stools consisting of undigested food, with a noticeable absence of bile. Albuminuria, and the occasional presence of either pus or blood in the urine, strongly suggest some renal complication. It is not uncommon to notice the development of dusky patches of skin, pustular eruptions, or the formations of boils, if the integumentary structures are implicated. A sudden complaint of pain on the part of the patient will often call the attention of the attendant to a joint swollen and rapidly increasing in size, but it is possible for several joints to be found painlessly implicated.

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[1] Patients have been known to linger for two, or even three months.

These are the more important symptoms which may be detected in a typical case; but, although they are none of them uncommon, we seldom find them all present. It will be well, therefore, to lay great stress upon the fits of shivering, the sudden and marked exhaustion, the icteric coloring of the skin, the labored and frequent respiration and the rapid emaciation, as of the greatest value in the diagnosis of existing pyæmia. Should the suppuration of joints and the development of abscesses appear with the symptoms above named, the diagnosis is almost absolutely certain.[1]

Now it may be asked, how are you to discriminate between these symptoms and those of septicæmia? I admit that positive distinctions are not always possible, if the case is studied alone from the standpoint of its symptomatology; but there are some diagnostic points which can generally be relied upon when the method of origin of the disease appears obscure, and when the presence of purulent deposits is not to be detected by any method of examination.

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[1] Relapses in pyæmia seem to be a marked clinical feature ; an apparent improvement often takes place and excites hopes of the recovery but the patient again sinks gradually with symptoms cf a low febrile character.

It has been my experience, from the study of quite a large number of cases of septicæmia, some of which have resulted fatally, that the first or initial chill is often the only one, and that this is never the case in pyæmia. Furthermore, in those cases of septicæmia where more than one chill occurs, those rigors which follow the initial chill are more erratic in their occurrence than in pyæmia, and are not always the precursor to a marked rise in temperature and profuse sweating. The course of this disease is also characterized by a higher temperature (103°–107°) and a shorter duration than pyæmia, provided that the amount of decomposing animal material introduced into the blood is sufficient to produce death; but, if the quantity introduced is small, or the introduction very gradual, the patient may have a continued fever with a lower range of temperature, and eventually recover, provided that the poison be neutralized and the infecting material thoroughly removed. During the course of septicæmic poisoning, an effort is often made by nature to eliminate the poison by means of the intestinal tract; hence a diarrhœa of a profuse and watery character is sometimes met with in these cases.

As was stated in the morbid anatomy of this disease, the tendency to suppuration, which is so characteristic of pyæmia, is generally absent, and I have no hesitancy in stating that I have never seen a metastatic abscess at the autopsy of what I would designate as uncomplicated septicæmia. When such abscesses are found, I would either be willing to exclude the septicæmic condition, provided the history of the case would permit me to do so, or I would regard the case as one complicated by pyæmia, if the history sustained the belief in previously existing septicæmia.

In summary, then, I would state that a marked chill followed by a decided increase of temperature and profuse sweating might, at the onset, suggest the existence of either septicæmia or of pyæmia, but I should be inclined to decide in favor of the latter if the chill was very sharp. If this initial chill should be followed by another, accompanied by fever and sweating, and, in a few days or hours, the same should be regularly repeated, I should be inclined to regard the case as strongly pyæmic in character. This opinion would be made almost a positive certainty if the exhaustion of the patient was rapid, the emaciation great, the breathing labored, the breath sweetish in odor, the skin deeply jaundiced, and if pus appeared in any of the glands, joints, organs, or other tissues. I should regard the presence of an open wound as strongly suggestive of pyæmia, rather than of septicæmia, provided that the wound had been properly cleansed each day; since decomposing animal matter would then have a small chance for prolonged contact with the injured part—an essential element, in my opinion, in the development of septicæmia. If the case terminated very rapidly—provided the conditions justified the possibility of septicæmia—I should be inclined to doubt the existence of the pyæmic condition. If the temperature ran very high—say up to 107° or 108°—I should regard the case as one of rapid septicæmic poisoning; but I should then expect a proportionately short duration of the disease to confirm the diagnosis. Finally, I should always be guarded—in the light of the pathological results of a suppurative phlebitis—in excluding pyæmia in favor of septicæmia, unless a most direct source for the absorption of decomposing animal material could be discovered.

## TREATMENT.

The question of treatment of these closely allied affections must be decided, in almost every individual case, by special symptoms which are presented; but there are general laws of treatment which will apply to almost all of the cases met with, and which cannot be too strongly impressed upon the profession. While I have shown that in all cases of septicæmia or pyæmia an open wound need not necessarily be present, still no one can dispute the fact that in very many instances the treatment—which will, perhaps, do more to prevent the diseases under discussion than to cure them when developed—must be, in part, of a purely local character.

LOCAL REMEDIES.—In a large proportion of patients suffering from septicæmia, the seat of contact of the decomposing animal matter with living tissues can be reached, and the cause often removed in time to prevent a fatal result, even if the case be not seen in time to prevent the introduction of such poisonous matter into the blood. But it is not enough, in these cases, to simply remove the existing cause. All surfaces which have been exposed to poisonous absorption should be thoroughly cleansed, and all existing germs destroyed by the use of disinfectants. The prospect of destroying poisons of this character by local measures is much less in old abrasions or suppurating wounds than in those of recent date; and all the greater care should therefore be employed in the general management of such sources of infection. I have frequently applied the actual cautery, fuming nitric acid, the solid stick of nitrate of silver, and other such agents, in order to destroy the tissue covering the entire surface of an old wound, and subsequently removed the sloughs by hot fomentations, rather than risk the danger of lurking germs of previously existing poison.

Among the different disinfectants[1] which have lately come into use, I have found few, if any, so efficient in destroying the germs of disease and decomposition, and so effectual in the quick removal of all odor as a solution of "Platt's chlorides" in water, in proportions varying from one to six to one to forty of water. It has, to my mind, a great advantage over the ordinary carbolic solutions in the entire absence of odor of its own, so that the presence of any offensive smell in the wound can be detected without being modified or disguised by that peculiar, and, to some, disagreeable odor of carbolic, and it seems to be equally efficacious as a disinfectant. But we must not rely too much on disinfectants, caustics, or other medicinal agents, since *frequent bathing* of the part, thus ensuring the complete removal of all foreign particles and accumulations of pus, as well as *perfect drainage* and *good ventilation*,[2] are essential aids to the successful prevention of systemic infection as well as to its cure when once established.

In the hospital ward, where the sick are crowded together, and in the private residence, where the escape of sewer gases often breeds disease, attention to the thorough disinfection of all the sinks, wash-bowls, privies, etc., as well as the complete closure of the overflow-pipes to basins, which are seldom if ever washed by a stream of water flowing through them, may prevent, and sometimes also arrest, pyæmic development. Much of the puerperal fever of the public hospitals can be traced, when an epidemic first appears, to the use of one sponge, syringe, wash-basin, etc., throughout the ward. The decomposing blood-clots in the vagina of one are thus directly carried from bedside to bedside, and, by means of utensils used without the proper cleansing, the fault of the nurse or her lack of knowledge spreads a pestilence and sacrifices life.

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[1] Aerial disinfection by nitrous acid, the various ethers, etc., seems destined soon to play an important part in the prevention of septic poisoning.

[2] I am inclined to believe that patients can be saved from pyæmia by being placed in tents with free access to the air better than by any other means. In private dwellings the removal of the windows will answer perhaps as well, since the patient can be protected from inclement weather and cold by the use of blankets, screens, etc.

We have spoken, thus far, only of open wounds or abrasions, and the methods by which either the absorption of decomposing matter in direct contact with the wound, or of the pyæmic miasm present in the wound, air, bed-clothes, etc., can be prevented; but we have not considered under the head of local measures the relief of those varied conditions where collections of decomposing pus are long confined by the negligence on the part of the surgeon to establish evacuation, drainage and absolute purification of the cavity.[1] How cavities containing pus should be treated opens a large field for discussion, whether by incision and the insertion of drainage tubes, or by aspiration and compression. These questions can only be decided, in my opinion, by the circumstances which surround each individual case. As a rule, I believe that decomposition of any retained organic material does not progress until air is brought in some way in contact with the cavity which holds it; and I therefore think that, in those cases which admit of it, aspiration offers a better prospect of its complete evacuation without subsequent decomposition of the secreted pus than any form of drainage, no matter how perfectly the cavity is disinfected and cleansed. Still I know that many cases will not admit of its successful application, and, in such, I would advocate the most careful attention to perfect drainage and disinfection of the cavity. When long sinuous tracts exist through which pus is discharged from deep pockets, the early establishment of counter-openings and the insertion of drainage tubes, which shall perfectly empty all accumulations of burrowing pus, will tend to greatly lessen the danger of systemic infection.

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[1] The development of septicæmia and pyæmia is often due to the fault of the surgeon or he attending nurses. Too great care cannot be exercised in preventing systemic infection.

GENERAL REMEDIES.—As soon as the presence of either of these diseases becomes known, it is the duty of the medical attendant (1) to allay nervous irritation by all means in his power; (2) to promote, if possible, the elimination of existing poison in the blood ; and (3) to support the strength of the patient. It is well to always make inquiries as to the general condition and habits[1] of the patient before adopting any special line of general treatment, since principles which hold good for all must be variously modified by the symptoms of individual cases for their special benefit.

*To aid in elimination*, in the first place, the patient should be kept warm and the free action of the skin encouraged by the use of diaphoretics. Of all diaphoretics I prefer the hot-air bath, although the vapor bath is preferred by some patients as more agreeable. These processes of possible elimination of the poison may also be assisted by the judicious use of medicines destined to stimulate the secretions of the intestinal canal, liver and kidneys. Calomel and jalap should be administered early in every case, where the possibility of systemic infection seems to be suggested, and bicarbonate and bitartrate of potash often proves of value as a renal excitant. It is claimed by some authorities that the stage of collapse is hastened by the use of diaphoretics and diuretics; but I have not found that such was the case, provided the employment of the drugs suggested was tempered with prudence. It cannot be disputed that reported cases of recovery can be adduced in support of the eliminative plan of treatment, but it is difficult to decide as to the actual value of this or any other line of treatment until the sources of scientific data are increased. In all cases, the cause of the systemic infection, if local, should be immediately removed.

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[1] The influence of low conditions of the system on the character of inflammation within veins, has already been discussed.

It has been claimed by some observers that the internal administration of the sulphites and chlorides of soda and potash as an antidote to the poison has assisted in the recovery of the patient and the rapid elimination of the poison, but it is to be regretted that the experience of many of the most reliable authorities does not sustain their efficacy.

The intense *nervous depression* under which these patients so quickly fall, is best relieved by opium; and my own preference is for the use of small doses of Dover's powder, to be given at night, in addition to opium during the day if the patient's symptoms seem to demand it. If vomiting supervenes, the administration of dilute hydrocyanic acid, iced carbonic acid water, or even small doses of chloroform will often check it. If a diarrhœa occurs, unless it be so excessive as to exhaust the patient, it should be encouraged rather than checked, as it may be an effort on the part of nature to eliminate the cause of the disease. The judicious use of quinine may also relieve nervous depression by increasing the general vigor and controlling the temperature.

A *tumultuous action of the heart*, accompanied by a sense of great uneasiness in the præcordium, and some *dyspnœa*, should suggest the employment of digitalis as a heart tonic; this drug is especially agreeable in its results upon such cases, since it increases the action of the kidneys[1] at the same time, and thus helps to remove the cause of the disturbance to the circulation.

Not least in the order of importance, is the *necessity of supporting the patient* during the progress of the disease.

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[1] The diuretic action of this drug is purely mechanical, since it acts upon the kidneys by increasing the *power of the heart.*

From the very onset, measures of this kind are required in most cases, and stimulation as well as some form of tonic treatment will generally be demanded. The quantity of stimulants to be administered, as well as the time when their administration should be commenced, vary so much in individual cases and depend so much upon general principles of treatment, that it is hardly necessary to consider them in detail here; but I believe that the quantity given should be small and often repeated, and that the stimulants should, as a rule, be given with as light and nutritious food as will be borne by the patient without exciting nausea or vomiting. In these cases, the pulse is not a valuable guide to the administration of alcohol, since the circulation is under the influence of a subtle poison, and gives constant evidence of its effects.

The *great danger of relapses* in pyæmia naturally suggests that the period of apparent convalescence should be associated with every element of precaution to ensure renewed vigor. A change of scene, a cool, bracing atmosphere, free from all malarial influences, the internal administration of iron, and a continuance of stimulants in proper doses will all assist in bringing about complete recovery.

We have so far discussed the treatment of both pyæmia and septicæmia as varieties of systemic infection, but, as has been stated in previous portions of this lecture, the danger of pyæmia, when fully developed, is to form metastatic abscesses in organs, joints and other tissues. If the case be one of that type dependent upon a suppurative phlebitis, the patient must have been in a bad general condition at the time that such suppurative inflammation was excited; hence all the more necessity for stimulants, tonics, etc., if we hope to arrest the process before emboli are formed. Great *physical depression* after any form of injury should put us on our guard as regards the possibility of this complication. No local treatment can prevent the formation of these secondary abscesses (although Hunter recommended pressure upon the vein inflamed above the seat of the morbid action) provided that emboli are once formed by the disintegration of the thrombus within the inflamed vein. It is this distressing statement that leads all of us to regard the question of prevention as one of paramount importance. The success of an operation often depends upon the skill of the surgeon in building up the constitution, changing the character of the secretions by the proper use of alteratives and tonics, regulation of the diet, and, if intemperance has existed, in so diminishing but not withdrawing alcohol as to promote a more healthy mode of life.

No surgical operation should ever be attempted without a thorough examination of the condition of the internal organs, where such a step is practicable. The urine should be searched for albumen, sugar and casts; the thoracic viscera examined for lurking disease; the abdomen explored for aneurismal or malignant growths, and the size of the various abdominal organs carefully mapped out by auscultatory percussion. Chever lays great stress upon the advisability of subjecting patients about to undergo a surgical operation to restraint in bed for some days before the operation, in order to prepare the patient to the change of life which the operation will demand until convalescence, and I believe that the suggestion is one well worthy of the serious consideration of surgeons.

Whether chloroform or other anæsthetics subject the patient to additional danger from pyæmia by their depressing influence, is still an open question. That they do lessen the reaction is unquestioned, but do they not also diminish the shock of the operation?

Finally, all precautionary measures as to the carrying of infection by the nurses or medical attendants should be most carefully guarded against. This danger is, of necessity, greater in the hospital ward than in the private dwelling, on account of the confined air and the frequent over-crowding, but it may still prove a source of great danger where least expected. Scrupulous attention to a frequent change of bed-clothing, and the prompt destruction of all dressings after removal, will tend to lessen the possibility of this mode of propagation.

## BIBLIOGRAPHY.

ADDISON. "Experimental and Practical Researches on Inflammation," *Trans. Prov. Med. Ass.*, 1842.

ARNOTT. "Inflammation of the Veins." *Med. Chirg. Trans.*, vol. xv., 1829.

BARKER. "Puerperal Diseases." 1878.

BECQUEREL and RODIER. "Pathological Chemistry" (Eng. Translation).

BILLROTH. "Surgical Pathology." 1870.

BOUCHUT. "Mémoire sur la Coagulation du Sang Veineux." *Gaz. Médicale*, 1845.

BRAIDWOOD. "Treatise on Pyæmia."
"Article on Pyæmia." *St. Barthol. Hosp. Reports*, vol. i.

BRISTOWE. "Article on Pyæmia." *Reynold's System of Medicine.*

CALLENDER. "Article on Pyæmia." *Holmes' Surgery*, vol. i.
"Article on Diseases of the Veins." *Holmes' Surgery*, vol. i.

COHNHEIM. *Virchow's Archiv.*, vol. xi-xiv.

DANCE. *Arch. Generales de Med.*, 1828–1829.

DELAFIELD. "Studies in Pathological Anatomy." 1878.

DONUÉ. "Cours de Micrographie." Paris, 1844.

GASPARD. *Journal de Physiologie*, tom. ii.

GENDRIN. "Histoire Anatomique des Inflammations."

GULLIVER. *Med. Chirg. Trans.*, vol. xxii.

HUMPHREY. "Coagulation of the Blood in the Venous System During Life" (quoted by Callender).

HUGHES BENNETT. "Resemblance Between Pyæmia and Leucocythæmia" (quoted by Braidwood).

LEE. "Treatise on Phlebitis." 1850.

LISTER. "Early Stages of Inflammation." *Phil. Trans.*, 1859.

MORGAGNI. "De Sedibus et Causis Morborum" (quoted by Callender).

PAGET. "Lectures on Surgical Pathology" (Turner's Edition).
"Pyæmia." *St. Barthol. Hosp. Rep.*, vol. i.

RIBER. "Recherches sur la Phlébite." *Revue Medicale*, tom. iii.

ROSE. *Med. Chirg. Trans.*, vol. xiv.
SANDERSON. "The Process of Inflammation." *Holmes' Surgery.*
SAVORY. "Local Congestions and Suppurations in Pyæmia." *St. Barthol. Hosp. Rep.*, vol. i.
SEDILLOT. "De l'Infection Purulente ou Pyæmie." 1849.
SIMPSON. *Med. Times and Gazette*, 1859.
STRICKER. "Human and Comparative Histology" (Power's Translation).
TESSIER. "Exposé et examen critique des Doctrines de la Phlébite." 1838.
VELPEAU. *Revue Medicale*, tom. iv, 1826.
VIRCHOW. "Die Cellular Pathologie."

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# NOTES ON INTESTINAL DIVERTICULA.

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HAVING found a somewhat unusual specimen of the above abnormality at a recent autopsy, I was reminded of other instances which had come under my notice, and have thought that a few notes on the subject might be of interest to the readers of the ANNALS OF ANATOMY AND SURGERY, particularly as the information to be obtained from ordinary anatomical works is exceedingly meagre. Even in Henle's large work the matter is dismissed in a few lines. Some of the text-books on morbid anatomy contain very good accounts, as in Jones and Sieveking (Payne's ed.), and Birch-Hirschfeld; but for a full and satisfactory description we must go to the works of the great Meckel (whose name the single *diverticulum ilei* commonly bears) where, in the "Handbuch der Pathologischen Anatomie" (1812), the subject is treated at great length, and we have an admirable example of the thoroughness with which the older anatomists did their work. No detail has escaped him, and I doubt if any new point in structure or mode of development has since been determined.

A division is made of the forms of diverticula into true and false, or congenital and acquired.

*The true diverticulum*, Meckel's *diverticulum ilei*, is a rather common abnormality, occurring, in my experience, in somewhat over two per cent. of bodies. I have met with twelve instances in about 550 inspections. It is invariably solitary, springs from the ileum opposite the mesenteric border, at a distance of three or four feet from the valve, and is distinguished from a false diverticulum by the presence of all the tunics of the bowel. It varies in length, in the specimens which I have examined, from one to six inches, and, when distended, is cylindrical in form or, in the small ones, funnel-shaped. The size of the canal is usually smaller than that of the intestine; in one instance only have I seen it of equal width. It is sometimes wider at the distal end than at the orifice, which may be protected by a valvular fold. The blind extremity frequently presents one or two saccular dilatations. It is usually attached at right angles to the bowel, but in several of my specimens the direction is oblique. The extremity may be free or have attached to it a fibrous cord, which passes to the abdominal wall in the region of the navel. In one instance I found a fibrous and fatty cord passing from the end of the diverticulum to the adjacent mesentery, forming a noose which admitted three fingers. Specimens have been described with a definite fold of mesentery attached along one border. When inverted the mucosa resembles that of the ileum, and large specimens often contain Peyer's patches.

Prior to Meckel's observations, this process was believed to originate either by distension of the bowel or by the dragging of adhesions from without. He showed that it was congenital, and offered a rational explanation of its occurrence as a remnant of the omphalo-mesenteric duct which connects the primitive intestine with the umbilical vesicle. The different degrees of malformation which may arise from the existence of this communication are thus described by Birch-Hirschfeld,[1] and it was the existence of these various grades that led Meckel to the happy solution of the question: "The malformation, which is to be regarded as an arrest in the development of the bowel at one of the steps when it is in connection with the umbilical vesicle, exists in the most extreme degree when there is a fissure in the abdominal wall below the navel, through which the ileum opens. The lower part of the bowel is, as a rule, very narrow or completely closed, and the fæces pass through the opening at the navel. In the next grade the abdominal fissure also exists, and the ileum is in direct communication with the opening at the navel by means of the patent ductus omphalomesaraicus, but at the same time the lower part of the bowel is well developed and the fæces pass into the colon. Then, there are those instances in which the ventral fissure is closed, and a blind process of the ileum exists which is united to the navel by the obliterated ductus mesaraicus, represented as a solid fibrous cord; and, lastly, as the slightest grade, the omphalo-mesenteric duct remains as a free diverticulum from the ileum."

The interest in this abnormality is not merely anatomical, as its presence is accompanied with certain dangers, and in a large number of cases it has been the cause of fatal mischief. In a few instances in which the process has extended into the navel-string as a narrow canal, it has been cut in the separation of the child. The chief danger arises when the extremity of the diverticulum is attached to the abdominal wall or contiguous parts. Many cases of strangulation of the bowel have been reported from this cause. More rarely acute obstruction has occurred from constriction of the bowel in the neighborhood of the process—Dr. Southey has reported two such cases.[1] When unattended it is seldom a source of trouble. Occasionally foreign bodies enter and excite inflammation, as in a case reported by P. Beale,[2] in which cherry-stones and orange-pips were found, and in one by Mr. Doran,[3] in which a pea had excited ulceration. I have not met with a recorded instance of trouble from impaction of hardened fæces. Typhoid ulceration has been found in a Peyer's patch in the diverticulum. I saw an interesting specimen of this at the New York Pathological Society last Winter, and a case of perforation of such an ulcer is reported by Dr. Galton.[4] The process sometimes finds its way into one of the peritoneal rings as a hernia. Littre (1700) and Mery (1701) are quoted by Meckel as having reported cases of this kind. Dr. Dowse has recorded [5] a curious instance of a woman aged 77, who was attacked with vomiting and pain in the groin, where ultimately a fæcal fistula became established. Patient died three months after, when a diverticulum ilei was found to have passed into a direct inguinal sac, becoming adherent, inflamed and perforated. Dr. Hare [6] met with a diverticulum 1¾ inches long in the inguinal canal in a patient who had had several attacks of abdominal pain, with vomiting and constipation, during one of which he died. The bowel was constricted above the process, which Dr. Hare regarded not as a congenital diverticulum, but as a portion of the bowel which had become adherent at the ring and gradually drawn in. I met with a somewhat similar instance, and it was difficult to

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[1] Loc. cit.

[1] Clinical Society Transactions, vol. v.

[2] Path. Society Transactions (London), vol. v.

[3] Ibid, vol. xxix.

[4] Ibid, vol. xxiii.

[5] Lond. Path. Soc. Reports, xxvi.

[6] Ibid, vol. vii.

decide whether the small hernia was a true diverticulum or only a portion of the bowel drawn into the ring.

The *false diverticula* occur in any part of the intestinal canal, often in large numbers, are usually situated at or near the mesenteric border, and seldom consist of more than the mucosa, which forms a sort of hernial protrusion. If we except the little saccular diverticula the size of small peas, of which an occasional instance is not uncommon, this variety is less frequent than the other. I have notes of only three or four such. In one a protrusion the size of a walnut existed in the duodenum just below the papilla. It communicated with the bowel by a wide orifice, and appeared to consist chiefly of the mucous coat, though no rent was evident in the muscular coat, which appeared rather thinned and wasted. I met with a most remarkable instance a few weeks ago in the person of a man aged 65, who died of an acute enteric attack with melæna.[1] The jejunum presented fifty-three diverticula on the mesenteric border—all of hemispherical shape and attached by broad bases. They ranged in size from a cherry to a large apple. One measured 8 by 6 cm. Six of them were larger than billiard balls. The walls were somewhat thinner than those of the intestine, but the larger ones presented a distinct though thin muscular investment. All contained fluid fæces; two of the larger ones were fully distended. The mucous membrane looked normal, but was, perhaps, a little thinner than in the bowel. The valvulæ conniventes were absent. When distended with air and dried, and openings made in the bowel opposite the diverticula, it was seen that some of them had imperfect valvular folds at the margins of the orifices. They lay between the peritoneal surfaces of the mesentery, and numerous blood vessels coursed over them. There were not any in the ileum or colon. They were not connected with the acute enteric trouble which caused death, and which was situated in the lower part of the ileum. So far as could be ascertained, the patient had not been a very constipated man, but had for years been subject to colicky pains in the abdomen, which may have been associated with these diverticula.

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[1] I am told by Dr. Trenholme that for years the patient had suffered much from loud rumbling noises in the belly, particularly after each meal. So loud were they that it was his habit, shortly after eating, to go out to take a walk and keep away from people, as the noises could be heard at some distance.

In the large intestine I have met with two instances of curious diverticula forming globular sacculi the size of large peas or cherries; very numerous in one case along the whole colon, in the other, confined to the lower part, and consisting of thin pouches of the gut filled with firm fæcal concretions. The number and arrangement gave a very peculiar appearance to the bowel when distended. They were not connected in any special way with the appendices epiploicæ. In one case the fæcal masses were of almost stony hardness, owing to the presence of lime salts. Many cases of this sort are reported—one by Mr. Sidney Jones[1] terminated by the ulceration of a sacculus into the bladder.

The false diverticula are caused, in the majority of cases, by distension of the bowel either by fæces or gas, and are rarely more than hernial protrusions of the mucosa. The occurrence in such numbers as in the above reported case is uncommon. Dr. Gross, in his "Pathological Anatomy," 2d ed., p. 601, figures a somewhat similar specimen, and refers to other cases seen by Monro, Cruveilhier and Sir Astley Cooper.

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[1] Lond. Path. Soc. Transactions, vol. viii.

# NOTE UPON CERTAIN BILATERAL ANOMALIES OF THE OBTURATOR ARTERY.

By A. H. P. LEUF, M.D.,

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THE following observations are of interest in connection with the subject of operations for the relief of strangulated femoral hernia. It will be seen that the second anomaly mentioned in this note would not necessarily be followed by hæmorrhage from incisions in the usual direction. These observations were made in the dissecting-room of the Long Island College Hospital:

In one subject, on both sides, the obturator artery arose from the inner side of the femoral artery, 1 centimetre below Poupart's ligament; thence going forward along the inner side of the vein it passed through the femoral ring, hugging the edge of Gimbernat's ligament. After leaving the ring, both vessels pursued their normal course.

In another subject both obturator arteries arose immediately underneath the ligament of Poupart, so that it was difficult to tell whether they came from the external iliac or femoral. Both vessels passed downward from their origin, forming a loop about 1 centimetre long. On both sides, this loop and its retaining branch were situated between the femoral artery and vein and passed through the ring, hugging the pectineal ridge behind the vein and close to the artery. Thereafter the course and relations of both vessels were normal.

The right obturator artery of another subject arose from the femoral at its beginning, and entered the pelvis at the inner side of the ring. The obturator of the left side differed from its fellow only in origin, which was from the lower end of the external iliac.

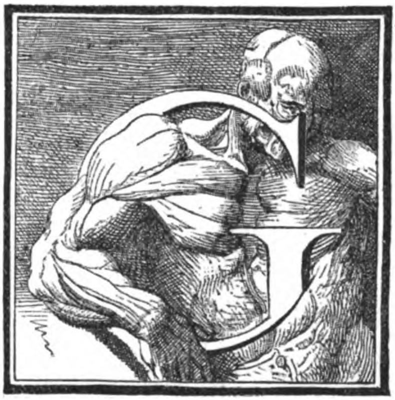
# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

### A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

### By GEORGE JACKSON FISHER, M. D.

## XV.—CLAUDIUS GALENUS (Continued).

### A. D. 130—200.



GALEN observes, in regard to the physical characters of the blood, that both the arterial and venous blood coagulate within as well as out of the body. He agrees with Aristotle as to its cause being due to the existence of certain fibrous particles in this fluid, the absence of which prevents the blood from coagulating. He considered the aqueous serum to be the vehicle of the nutriment of the several parts and organs of the body, and that the superabundant aqueous particles are separated by the kidneys. He taught that every organ of the body is endowed with a special sensibility whereby it attracted what was useful to itself, and rejected or expelled whatever was useless or injurious. Galen describes clearly the form and position of the tricuspid and mitral valves, and also the sigmoid valves of the aorta and pulmonary artery. Erasistratus and his followers taught that the arteries are air-vessels, being filled with the vital spirits and never properly with blood. He admitted that they anastomose with the extremities of the veins, and that, under certain morbid conditions, blood found its way into the smaller arterial branches. Galen denied that they are air-tubes essentially—believed that the vital spirits were mixed with the arterial blood, and flowed thus together. While he regarded wounds of the veins as dangerous, he held that wounds of the arteries were, for the most part, mortal.

It seems that the teachers of anatomy in Galen's day continued to instruct their students to believe the erroneous doctrines of Erasistratus concerning the aerial function of the arteries. Galen relates a very entertaining anecdote with reference to the final decision of this question. Though somewhat lengthy, I cannot forbear to quote it: "There are some teachers who are in the habit of advancing opinions which they are not prepared, and therefore not inclined, to put to the test. Such was the case with a certain teacher of anatomy who, having declared that the aorta contains no blood, and having been earnestly desired by several ardent pupils to exhibit the requisite demonstration, they themselves offering animals for the experiment, declined, after various subterfuges, to satisfy them without a suitable remuneration; on which the pupils immediately raised among themselves a sum of money amounting to one thousand 'denarii'—or 'drachmæ,' being probably about one hundred and twenty-five dollars of our money—and placed it before him as an inducement to prove his assertion. After much prevarication, when urged to proceed by all present, he took the scalpel in hand and began by making an incision in the left side of the chest, where he imagined the artery could be exposed; but such was his want of anatomical skill that he cut directly down upon the bone. One of his associates, however, having opened through the intercostal spaces, he, again proceeding, injured in the first place the artery, and afterwards the vein. The young men who had deposited the money with the spectators, now, laughing at him, undertook the experiment themselves. They dissected through the intercostal spaces, as they had been previously taught by me, in such a way as not to injure the vessels, and without delay surrounded the artery with two ligatures—one at its point of departure from the heart, the other where it rests upon the spine, just as these boastful teachers had promised to do, in order that when the animal was dead one might see, from so much of the vessel as lay between the ligatures, whether or not the artery was empty of blood. But when it was not found to be empty, they declared that an incision must have been made in it at the time of applying the ligature; as if some other individual, and not these teachers themselves, had promised the demonstration. For they had never tried the experiment in presence of witnesses, nor could they have had much skill in applying the ligatures, since they did not even know that the artery and vein both extend to the lower boundary of the ribs."

It is indeed wonderful to observe how nearly Galen approached to the discovery of the circulation of the blood. As we have seen, he knew that both the arteries and veins are blood vessels. He said the heart is evidently the source of pulsation, since if a ligature be made on any artery, pulsation continues in that part of the artery which is intermediate to the ligature and the heart; but ceases in that part of the artery which is intermediate to the ligature and the extremities. He describes the valves of the heart, and those at the roots of the great vessels, and saw their evident action. He knew, for he says he has often made the experiment, that by opening a large artery all the blood of the body flowed out, not only from the arteries, but also from the veins; and he arrived at the inevitable conclusion that the arteries and veins must mutually anastomose. He fairly describes the double circuit of the blood, and yet failed to comprehend it. He observes that the blood which the heart receives into its *right* cavity from the *vena cava* it sends directly to the lungs through the *vena arteriosa* (pulmonary artery); and that from the lungs the blood is conveyed by the venæ arteriosæ (pulmonary veins) through the *left* cavity of the heart to the aorta; and from the aorta to every part of the body. (Kidd, *op. cit.*, p. 320. Kühn's ed. of Galen, vol. ii, p. 615, and vol. iv, p. 671.)

The reader may ask why, then, did he not understand the double circulation of the blood? It is very obvious that he did not when he confesses that he is totally unable to explain why nature, which does nothing vain or without design, should have made two different sets of vessels—arteries and veins—to contain the same fluid. This he attempted partially to explain by saying that the venous blood is heavy and thick, and the arterial blood spirituous and thin. That some organs require thin and others thick blood; that the thinness of the venous coats readily transmitted the thick blood, while the greater thickness of the arterial coats was required to restrain the too ready transmission of the thin and spirituous blood.

His theory of respiration was that the heart being the source of the innate heat of the body, which he compared to a stove that warms a whole house, the use of respiration is to moderate this heat. He describes two kinds of respiration—pulmonary and cuticular; the latter alone he believed to be sufficient for animals during the period of hibernation. He considered the diaphragm to be the principal muscle of involuntary respiration. He claims, however, to have been the first anatomist that ever pointed out the two sets of intercostal muscles, and their mode of action, they being, in his opinion, chiefly concerned in forced or voluntary respiration, which he calls an animal effort.

Galen went further than to suppose that respiration merely cools the innate and constantly accumulating heat of the heart and blood; he affirms that this heat is also absolutely produced by respiration. He says if we could find out why flame is extinguished by absence of the air, we might then know the nature of that substance which imparts warmth to the blood during the process of respiration. This inquiry was suggested by Claudius Galen about the middle of the second century, and was solved by Joseph Priestley on the first day of August, 1774, by his discovery of oxygen gas.

Galen describes the effects produced on respiration and the voice by the division of certain thoracic nerves; and particularly the division of the recurrent branch of his sixth pair of cerebral nerves—the pneumo gastric of modern anatomy. He explains why the division of this branch, though made on both sides, does not entirely destroy the voice. He also explains why the diaphragm continues to act after the spinal cord has been divided below the lower portion of the neck; that it is in consequence of the origin of the phrenic nerve above this point. (Kühn's Galen, vol. ii, p. 699.)

Here, as in many other instances, we find Galen engaged in making physiological experiments on living animals, involving not only great delicacy of manipulation and accuracy of anatomical knowledge, but instituted for the purpose of determining important physiological and practical questions. It may be truly said that the anatomists of the fifteenth and sixteenth centuries were not the fathers and founders, but rather the restorers and improvers of anatomy and physiology. We ought never to withhold our admiration of the primitive masters of anatomy. Galen observed the large size of the renal blood-vessels, and knew that the kindeys were organs of elimination and excretion. He traced the ureters, and noted the oblique direction in which they enter the bladder, and the valvular effect of this mode of insertion.

So complete was Galen's knowledge and descriptions in human osteology, that his only differs from a modern treatise on the subject in minor detail. As an example of the minute and systematic manner in which he treats the subject, in his description of the temporal bone, he divides it into squamous, styloid, mastoid and petrous portions. His is the first clear account we possess of the number and situation of the vertebræ, which he divides into cervical, dorsal and lumbar, and distinguishes from the sacrum and coccyx. He informs us that human osteology may always be studied with facility at the great public school of medicine in Alexandria, in Egypt; that the teachers of anatomy had long been accustomed to prepare human skeletons for the illustration of their lectures. He adds, that it will richly repay the trouble of any one to go to that city for the sole purpose of studying human osteology. The frontispiece of Cheselden's magnificent folio (*Osteographia*, or the anatomy of the bones, London, 1773) is a full-page steel engraving, representing "Galen contemplating the skeleton of a robber who, being killed by a traveller, had his bones picked in two days by vultures."

Galen's plan for the study of anatomy seems to have been that the student should first pursue a course of comparative anatomy, dissecting those animals most nearly allied to the structure of man, as the different species of monkeys, apes, etc. When speaking of the structure of the liver, he refers to such preliminary studies, and announces his intention of preparing a systematic treatise on comparative anatomy. "I do not propose enumerating here the number of lobes which compose the livers of other animals, because I have not, as yet, described the particular structure of any of their organs, except in a few passages in which I have been obliged to do so in order to illustrate what I have to say concerning man. If I live, however, I shall, at some time or other, describe the structure of the bodies of beasts, and furnish an exact anatomy of all their parts, as I have now done with respect to the various parts of the human body." Certainly, this does not look as if Galen had derived all his anatomical knowledge from dissecting the lower animals, and that he had never dissected the human cadaver, as has been frequently alleged. The following is an additional proof of his study of human anatomy: "It is not strange that they were deceived, since they only dissected the hearts and tongues of oxen; never considering that those parts are different in other animals from what they are in men."

Another method of acquiring anatomical knowledge which Galen recommends, is what may be termed fortuitous anatomy, which was the only mode tolerated by the Empiric school—viz.: such accidental opportunities as occasionally present themselves, and of which he availed himself a number of times in the course of his pedestrian tours, and which furnished the subject for Cheselden's frontispiece above alluded to. The following is Galen's own account of his personal experiences: "I have often," he observes, "examined human bones when decayed tombs or monuments have fallen in my way. A sepulchre, slightly built on the brink of a stream, having suffered from the violence of the torrent which had overflowed it, the body, carried away by the force of the current, stopped at last in a kind of a harbor bounded by pretty high banks. I had an opportunity of seeing this body, the flesh of which was already rotten, although the bones still adhered to each other, so that it resembled a skeleton prepared for the use of the student. At another time I saw the body of a robber lying on a mountain remote from any public road. He had been killed by a traveler whom he attacked, and the inhabitants of the vicinity, conceiving so wicked a man a proper prey for the vultures, refused him the rights of sepulture; and two days after his bones were stripped of their flesh, and dry like those prepared for students."

In myology Galen made great advances on what was previously known. He was the first to study the muscles systematically, and to classify them according to their functions —a method which has continued in use to the present time. Previous to his investigations much confusion existed as to what constituted a single muscle; he adopted the general rule of considering each bundle of fibres that terminate in an independent tendon to be one muscle. He was the first to describe and give names to the platysma myoides, the sterno and thyro-hyoides, and the popliteal. He described the six muscles of the eye, two muscles of the eyelids, and four pairs of muscles of the lower jaw—the temporal to raise, the masseter to draw to one side, and two depressors, corresponding to the digastric and internal pterygoid muscles. He described also the brachialis anticus, the biceps flexor cubiti, the sphincter and levator ani, and the straight and oblique muscles of the abdomen. In short, he described the greater portion of the muscles of the body, his treatise differing chiefly from a modern one in the minute account of these organs and in the omission of some of the smaller muscles.

In the nervous system we have already seen that his researches were quite extensive. Galen made careful dissections of the brain, made many discoveries and gave names to many parts, which are still retained; among others, to the corpus callosum, the septum lucidum, the fornix, and the corpora quadrigemina. He gave the old world the erroneous dogma that the nerves of sensation are derived from the brain, and those of motion from the spinal cord. To some nerves he assigns both sentient and motor power. He denied the decussation of the optic nerves, but admitted their junction at the commissure. He describes the par vagum and its connection with the sympathetic. He conceives that the soul is resident in the brain, and that sensation and the power of motion originate in this organ. He enumerates seven pairs of cerebral nerves, the same as are now admitted except the sympathetic and the external motor of the orbit; thirty pairs of spinal nerves, which he divides into four classes—viz.: eight cervical, twelve dorsal, five lumbar, and five sacral. He did not know that each had a double origin from the anterior and posterior columns of the spinal marrow. He claims to have discovered the ganglions of the nervous system. "Nature," he says, "has done an admirable thing, of which all anatomists, to the present time, were ignorant. When she conducts for a long distance a fine nerve, or one is destined to excite violent muscular movements, she locates a little mass on its track that resembles it in structure. Seen externally, this body appears to rest upon and surround the nerve; but when it is dissected, its substance is found to be in continuity with the nerve combining with its structure and resembling it in every particular. It is by means of this substance, which resembles a ganglion, that nerves augment in size." (*De usu partium.*)

Galen referred the degree of intelligence possessed by an individual rather to a just temperament of the body than to the complicated form or structure of any part of it. He observes that an unusually small or a remarkably large head are never accompanied by great talents. When, however, a large head corresponds with the just symmetry of nature, the latter rule does not hold; he then adds that Pericles furnished an example of such an exception. Galen did not refer all mental action and emotion to the brain; for while he considered it the seat of the rational mind, he regarded the heart to be the seat of courage and the angry passions, and the liver to be the seat of desire.

Very small, indeed, were the additions or corrections which were made to the anatomy and physiology of Galen for many centuries after the period in which he flourished. His doctrines were accepted without being questioned down to the beginning of the sixteenth century, when Vesalius entered so zealously into practical anatomy, and dissected the human body with so much care. Vesalius having found some of Galen's descriptions not to correspond with human anatomy, but much more closely with the structure of parts in apes and other lower animals, and, notably, that this discrepancy pertained to some of the tissues of the eye, he therefore at once concluded that Galen and his contemporaries must have derived their anatomical knowledge from the mere dissection of brutes. Vesalius was severely critical and unsparing in his derision of Galen. In the first edition of his grand work on anatomy (1543) Vesalius animadverted upon what he believed to be the errors of Galen to such an extent that eight folio columns of his index are entirely taken up by references to these corrections; and in the second edition of this magnificent work (1555) no less than twelve long columns of the index repeats the name of Galen hundreds of times. And yet Galen was not as erroneous as Vesalius supposed him to be. Among the defenders of Galen were Andreas Laurentius, Jacobus Sylvius, and Joannes Riolanus, of Paris. With such opponents it is not strange that the disputations were not of the milder sort, but ran high and hot. It was the effervescence of a revolutionary and reactionary fermentation between the advocates of ancient authority and the investigators of progressive science. This was the beginning of the great medical reformation.

Vesalius wrote an entire volume of annotations on Galen, which in a fit of vexation he committed with some other manuscripts to the flames. Perhaps it is just as well for the world that they were never published.

[To be Concluded.]

# EDITORIAL DEPARTMENT.

## THE CASE OF THE LATE PRESIDENT JAMES A. GARFIELD.

The daily bulletins issued by the surgeons in attendance upon the President from July 2 to September 19; the complete record of the post-mortem examination made September 20, and published in the October issue of the *American Journal of Medical Sciences*, the review of the case by Dr. Frank H. Hamilton in *The Medical Gazette*, of October 1, and the report of the case by the principal attending surgeon, Dr. D. W. Bliss, in *The Medical Record*, of October 18, together form a sufficiently complete body of official information upon which to base a study of this case. During its progress the high position of the patient and the circumstances attending the infliction of the wound caused the greatest degree of interest and anxiety to be universally felt in the case; but no intelligent criticism of the surgical treatment of the case, by any one other than those in immediate attendance upon the patient, has been possible until this time. Now the facts are made patent to all, and criticism invited.

From these sources the following resumé of the case has been compiled. The records are fragmentary, but by their comparison it has been possible to frame this account, which it is believed will be of value for future reference:

In the morning of July 2, 1881, at 9.20 o'clock, President Garfield, then in robust health, was wounded by a ball of the size known as No. 42 conical, fired from a large-sized revolver, at short range. The point of entrance of the ball was in the back, four inches to the right of the median line of the spine and on a line with the eleventh rib. The immediate shock was profound, and lasted for about fourteen hours before evidences of reaction began to manifest themselves. By means of a finger passed into the wound, as well as by the use of probes, the track of the ball was traced to the inner side of the eleventh rib, which was found to have been fractured; resistance from soft parts prevented further exploration. Such examination was made immediately after the wounding, and again twelve hours later with the same result. No attempt to trace the course of the ball further was made, and upon the arrival of eminent counsel forty-eight hours after the wounding, the propriety of this course was sustained, and further exploration discouraged—a conclusion based upon the favorable progress of the patient up to that time, and upon the certainty that extended exploratory procedures would seriously complicate the case. The treatment adopted and persisted in until the termination of the case in death was expectant in character, and consisted in measures to sustain the general strength of the patient, to control pain, to give free vent to the discharges from the wound, and to keep the wound in as aseptic a condition as possible. Immediately after the reception of the wound, sharp pains had been felt by the patient in the right ankle, and subsequently in the course of the day in the left ankle also, accompanied by hyperæsthesia of the integument. A few days later hyperæsthesia of the integument of the right side of the scrotum was also observed. All of these symptoms are officially reported to have disappeared wholly in the course of the first week. But as late as during the third week it was stated by persons attending upon the President, though not officially recognized as belonging to the medical staff, that were it not for the "horrible pain in the feet" he would suffer but little. The administration of morphia, which was begun immediately after the injury, was continued until Augst 4, that is for more than four weeks. No symptoms of peritonitis appeared, nor did any deviation of the kidneys or the bowels from the normal discharge of their functions take place. The case progressed, without marked disturbance, for twenty days. The reports of the condition of the President, signed by all the physicians in attendance, were invariably favorable and reassuring. After daily reports that "the condition of the President continues favorable," on the eleventh day (July 13) it was announced formally that a gradual progress toward recovery was manifest; again, three days later (July 16), that the President was steadily progressing toward convalescence; three days later (July 19) it was announced that he had passed a better day than any since he was injured, and the day following (July 20) an "uninterrupted progress towards recovery" was announced. Three days later, and the twenty-second from the day of the injury, after a restless night, a slight rigor occurred in the morning followed by a temperature of 101°; at noon a second rigor occurred, with rise of temperature to 104°, and a pulse of 125 per minute; free perspiration, with fall of temperature to 101.7° during the evening, was followed by a third rigor just before midnight. These were referred to the retention of pus in a superficial sac which had been formed by burrowing beneath the latissimus dorsi muscle. Free incision of this sac was made during the morning of July 24. Some improvement in condition, as manifested by freedom from rigors, lower temperature and lessened pulse rate, followed the incision, and became still more pronounced forty-eight hours later, when the opening between the fractured ends of the eleventh rib was enlarged, a small detached portion of the rib was removed, and a drainage tube of larger calibre inserted. During the ten days following this procedure, bringing the history up to the end of the fifth week, the patient is announced to have made satisfactory progress, the temperature having had less mean elevation and fewer fluctuations than at any time in the history of the case, the extremes having been 98.4° and 100.5°. From 11 P. M., July 26, to 5 P. M., July 28, a period of forty-two hours, and again for a like period three days later, from the early evening of July 31 to the afternoon of August 2, the temperature remained normal. The range of the pulse was from 94 to 104 per minute. August 1 it was announced that the President had evidently made good progress on the road towards recovery; the next day it was announced that he was still better. From this time for two weeks, encouraging bulletins, announcing continued improvement, satisfactory, excellent, easy or comfortable days, continued to be issued. The bulletin of August 8 announced that the improved condition of the President had been taken advantage of to make a further opening to facilitate the escape of pus, that the operation had been done under ether, that it had been well borne, and that the general condition of the patient was even better than could have been expected after such an operation. This operation consisted in more freely incising the superficial pus sac opened July 24, and then guided by a director introduced through the opening between the fragments of the eleventh rib, which was found to pass downward into a hitherto undetected sinus, this deeper channel was freely opened, the incision having been carried through the transversalis muscle and transversalis fascia to reach it. A catheter introduced into this deep channel passed three and a half inches below the incision and in a direction toward the anterior superior spinous process of the ilium. The periods of steady normal temperature which occurred at the end of the fourth and the beginning of the fifth weeks were replaced in the middle of the fifth week by regular evening febrile exacerbations, which ranged throughout the sixth week from 101° to 102° of temperature. During the 13th and 14th of August the usual morning fall of temperature did not take place, although the bulletins announced that the President expressed himself as feeling better than for several days previous. During the night of the 14th a condition of gastric irritability manifested itself. Repeated vomiting occurred. During the next day and night this condition persisted. During August 16 he vomited but once, and after this date there was no further vomiting. During this period of gastric irritability the administration of food by the stomach was discontinued, and nutritious enemata were employed. The bulletins of August 15 show no urgency of symptoms nor remark any prostration, but in the bulletin of the following day, August 16, it is noted that the symptoms appear less urgent, though he had not rallied from the prostration of the preceding day as much as had been hoped. At this time it became known from unofficial information that there had been a progressive loss of flesh on the part of the President from the time of the injury so that he had become greatly emaciated, and that the attacks of vomiting had been accompanied by alarming general prostration. Immediately following the subsidence of the gastric irritability a commencing inflammation of the right parotid gland declared itself being first noticed August 18. This affection of the parotid, developed slowly, and was slightingly alluded to in the daily official bulletins as painless, stationary, not materially smaller or unchanged. The announcements as to his general condition remained favorable; on the 22d of August it was announced that his general condition was more encouraging; on the 23d, that aside from the unchanged condition of the parotid his other symptoms showed improvement; on the 24th, that the symptoms were quite as favorable as the day before, and that an incision into the parotid had liberated a small amount of pus. On the 25th the bulletins issued by the physicians announced both morning and evening that his condition was the same as the day previous, but a telegram from the Secretary of State, Blaine, to the Minister to England, Lowell, announced that the President had lost ground, that some of his symptoms were of the gravest character, that his mind at intervals was somewhat beclouded and wandering, and that his strength was failing. August 26 there took place a spontaneous discharge of pus into the external auditory meatus, but with no improvement in the general condition. By the afternoon of the next day a slight amelioration in the President's symptoms was announced. This daily became more decided as far as the sufferings occasioned by the parotid inflammation were concerned. August 31 a spontaneous opening into the mouth was discovered. During the course of this parotid complication repeated incisions at different points on the surface for the exit of matter were made. Finally, after the separation of a limited slough rapid repair took place, but a facial paralysis, which appeared during its progress, continued with slight improvement until the time of his death. During this period, and later, an eruption of suppurating acne appeared on various points of the surface of the body. As a sequel to the inflammation of the mucous membrane of the mouth, produced by the parotid inflammation, an acute bronchial catarrh developed. Hypostatic congestion of the lungs had already existed for some weeks. After the removal of the President to the seashore, September 6, a still further slight improvement in his general condition was reported, notwithstanding an extension of the bronchial catarrh into the ramifications of the bronchi of the right lung, producing limited broncho-pneumonia. After encouraging bulletins for several days, in which his condition was described as encouraging, reassuring and favorable, two days in which no improvement could be noted, were followed on September 17 in the morning by a sharp chill accompanied by severe pain over the anterior mediastinum ; this pain recurred at intervals of six to twelve hours up to the time of his death. After a temporary elevation of temperature to 102°, it fell to 98°. In the evening of the next day, September 18, another chill, with pain as before, followed by profuse perspiration and a febrile rise which lasted until midnight. At 8.30 A. M., September 19, another chill with similar attendants ; having soon subsided, a day of comparative comfort ensued until about 10 P. M., when a sudden collapse was manifested resulting in death in a few minutes. A post mortem examination, made eighteen hours after death, revealed that the bullet had passed through the eleventh rib, comminuting it at a distance of three inches and a half to the right of the vertebral spines; had struck and fractured the twelfth rib at a distance of inch and a quarter to the right of the transverse process of the twelfth dorsal vertebra (being two inches from the spine of that vertebra); and had passed through the body of the first lumbar vertebra, comminuting the cancellated tissue of its substance, and producing fissures which extended into the lower part of the twelfth dorsal vertebra, and others which extended into the intervertebral cartilage between the first and second lumbar vertebræ. Both this cartilage and that next above were partly destroyed by ulceration. Having passed about two and a half inches further to the left of the spinal column, and behind the peritoneum, the bullet had lodged in the adipose connective tissue immediately below the lower border of the pancreas, where it had become completely encysted. The track of the ball between the eleventh rib and the first lumbar vertebra was considerably dilated, and from it the pus had burrowed downward behind the right kidney, producing a channel which terminated in the deep sinus of the loin, which had been laid open, and which had received all the attentions of the surgeons. A rent in the splenic artery, nearly four-tenths of an inch long, with edges everted and firmly adherent to the surrounding connective tissue, was found. From this a hæmorrhage had taken place, the blood having worked its way to the left through the adjoining connective tissue above the pancreas and behind the peritoneum, until finally it had burst through the peritoneum behind the spleen into the abdominal cavity. An abscess containing about two ounces of purulent matter between the under surface of the liver, the transverse colon and the transverse meso-colon, and a minute abscess in the cortex of the left kidney, were the only other noteworthy lesions found in the abdominal cavity. The lungs presented the conditions of bronchial catarrh and broncho-pneumonia which had been recognized before death. No abscesses or infarctions in the lung tissue, or in the liver and kidneys, were found.

Certain reflections upon the case thus detailed cannot be avoided. There are questions which will continue to be asked, and upon the answers to which procedures in cases of similar character hereafter must be based. It is apparent from an inspection of the accompanying temperature and pulse charts that from the fourth day there entered into the case an influence which persisted to its close. These regular and persistent fluctuations over a slight range, coupled with progressive emaciation and slow ebbing of muscular strength, notwithstanding the patience and hopefulness of the patient gave rise to delusive impressions of improvement, show septic infection as early and continuously present. While the more evident conditions of suppurating thrombi, of embolic infarctions and metastatic abscesses which make up an *ensemble* of pyæmia are absent, the conditions which mark chronic septicæmia are unmistakable. The gastric irritability, the parotid inflammation, the suppurating acne, and the carbuncle on the back, are all expressions of this septic condition. Though the record of the case shows that these symptoms were all combatted with consummate skill, yet their cause was left untouched. That the injury to the splenic artery should have become, after eleven weeks, the source of a fatal hæmorrhage, can be explained only by a failure of repair and a condition of degeneration due to the general depraved blood state. No one will be so absurd as to claim that the rent in the splenic

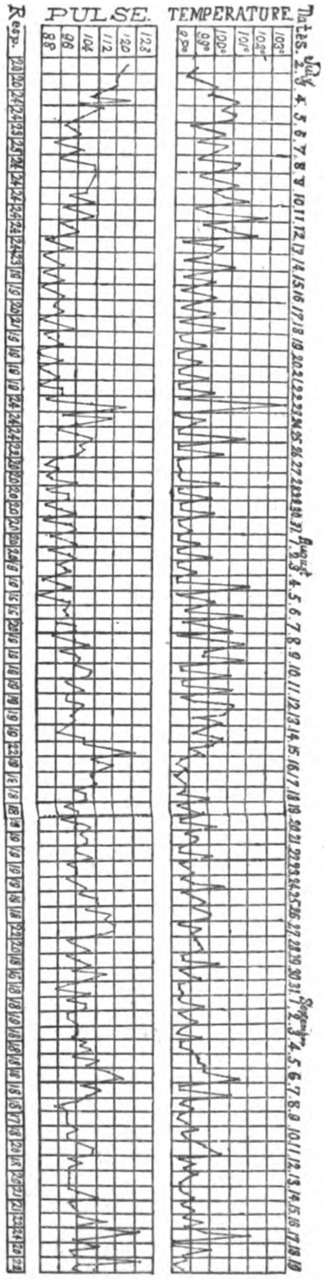


DIAGRAM SHOWING VARIATIONS OF TEMPERATURE, PULSE AND RESPIRATION IN THE CASE OF PRESIDENT GARFIELD.

artery, four-tenths of an inch long, was made by the ball at the time of its entrance into the body. No slowly dissecting aneurism would have resulted from such an injury to a large artery so near the heart, but an overwhelming and speedily fatal hæmorrhage. The erosion of the arterial coats must have been due to their involvement in the ulcerative processes going on in the track of the ball, tissue death instead of tissue building, the culmination of the weeks of general blood-contamination. The occasion of this septic infection is manifestly to be found in the retention or incomplete escape of the debris and discharges from that portion of the wound beyond the fractured eleventh rib. In raising the question whether in this case the resources of surgery were exhausted while this condition was unrelieved, not the slightest idea of unfriendly criticism of the eminent gentlemen having charge of the case can be entertained. Their judgment was, after taking all the circumstances of the case into account, that all that was prudent to do had been done. Great responsibility was upon them, and at such times all men become cautious. Critical examination, however, of the case may afford some lesson of value for the future. The wisdom of deferring further exploration on the 4th of July, when, though everything pointed to a perforating wound of the abdomen, the apparent progress of the patient was most favorable, none can gainsay. When, however, did it become manifest that this favorable progress had ceased? To us, now, as we study the chart of the first three weeks, the indications of unfavorable progress after July 6 are unmistakable, and the explosion of July 23 means much more than a superficial pus sac. We cannot but regret that the occasion of the removal of the splinter of the rib on July 26 was not improved for the thorough exploration of whatever conditions lay beyond it. Had the sinus leading to the splintered vertebra then been detected and freely opened up, it might have been that the nation would not have been in mourning to-day, for certainly there was nothing necessarily fatal in the condition of the bone itself.

In extenuation of the failure to trace the course of the ball any further than the eleventh rib, stress has been laid upon the supposed considerable deflection of the ball at that point so as to make a track so sinuous as to make satisfactory exploration impossible. It is to be regretted that the anatomical relations of the parts injured, as exposed *post mortem*, negative the existence of any such deflection. At the post mortem examination the track from the skin to the rib was healed and a depressed cicatrix alone marked its place. Four points in the track of the ball were, however, positively fixed—viz.: the points of impingement on the two ribs and on the vertebra, and its final resting place behind the pancreas. A straight line will connect them all. To study the anatomical relations of this bullet-track, Plate XV of Braune's Atlas of Topographical Anatomy will be found invaluable. It represents a transverse section of a body through the middle of the first lumbar vertebra, and, far better than any of the imaginary diagrams which have been published, exhibits the manner in which a bullet with unswerving course might successively penetrate eleventh rib, twelfth rib and body of lumbar vertebra to reach the posterior surface of the pancreas. All the established facts indicate that the track in the tissues between the eleventh rib and the skin was likewise in this line; the great apparent distance along the wound from the skin to the rib, so great that the little finger thrust in to its full extent barely reached the inner side of the injured rib, demonstrates that this channel was an oblique one; while the known behavior of conical balls, especially at short range, continuing a direct course, penetrating all tissues in their way till their power is exhausted, lends its weight in contradiction to the existence of deflection. No description of the appearance of the ball when found has anywhere been given. If it had been flattened or greatly distorted by glancing from a bone, the fact would certainly have been noted. The only conclusion which can be drawn from all these facts is that the ball from the moment of its entering into the body till it finally rested behind the pancreas pursued a straight undeviating course.

There is one lesson which this case teaches which is especially illustrated in the report made by the principal attending surgeon—namely, the danger of making a diagnosis. It is evident that having made a diagnosis of a lesion of minor importance, all its mutations were by him interpreted in the light of that diagnosis and the significance of the profound symptoms which the case presented failed to be appreciated by him. A candid confession that the data were insufficent and the retaining of the mind in a judicial state thrôughout would have saved medical science from the opprobrium which has been cast upon it by the revelations of the autopsy in this case. The possibility of a preconceived opinion—yclept diagnosis—to warp the judgment, explains how it was possible for bulletins announcing uninterrupted progress toward recovery to be issued when the condition was really one of uninterrupted emaciation and septic infection; for the physicians to announce that the symptoms showed improvement, while the Secretary of State telegraphs that the symptoms are of the gravest character and the strength failing; and for declarations that the patient is convalescent, when he is at the point of death from intense septicæmia. LEWIS S. PILCHER.

## SCHÜLLER ON THE ÆTIOLOGY OF CHRONIC INFLAMMATION OF THE BONES AND JOINTS.[1]

Professor A. Lücke, of Strassburg, in vol. xiii of the *Deutsche Zeitschrift für Chirurgie*, published an article on the ætiology of chronic ostitis and periostitis. In this article Lücke invited others to express their opinions on the relation between chronic inflammation of the bones and joints and infectious diseases preceding such inflammation. Professor Schüller's paper appeared, in response to Prof. Lücke's invitation, in vol. xiv of the *Deutsche Zeitschrift für Chirurgie*, and in the following we give a brief abstract of it:

Billroth, Volkmann and Hueter, as well as Lücke, mention as causes of inflammations of bones and joints injuries, acute infectious diseases (septicæmia, pyæmia, infectious osteomyelitis, erysipelas, puerperal fever, scarlet fever, small-pox, diphtheria, epidemic parotitis, typhus, dysentery), gonorrhœa and syphilis, acute and chronic rheumatism, deforming arthritis, gout, chronic poisoning by phosphoric acid, metals, etc., scurvy, tuberculosis and scrofulosis. Some of these affections cause mainly acute and, in exceptional cases only, chronic inflammations, which latter follow the former. Schüller agrees with Lücke that chronic inflammations of bones and joints may be caused by a number of other conditions in addition to tuberculosis.

It is easily understood that infectious diseases in the form of general affections of the whole system also react upon the bones and joints, but only the more recent experimental observations of Rosenbach, Kocher and Schüller himself have shown under what conditions special inflammations of bones and joints develop themselves. The question, which of the two, the tuberculous or the non-tuberculous inflammation of bones and joints is the more frequent, is yet undecided.

Another question: 'Can there develop inflammations of bones and joints in consequence of non-tuberculous conditions presenting the same objective symptoms as those depending on tuberculosis?' is answered by Lücke in the affirmative. If this were correct, says Schüller, we should consequently suppose that certain non-tuberculous chronic inflammations of bones and joints could be distinguished from the real tuberculous ones neither by their histological condition nor their clinical symptoms.

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[1] Die Ætiologie der Chronischen Knochen- und Gelenkent-zündungen. Von Prof. Dr. Max Schüller. *Deutsche Zeitschrift f. Chirurgie*, xiv, Bd.

From observations made in the clinic of Greifswald, the author next speaks of the histological changes: "It appears to me that as yet no conclusive evidence has been produced that non-tuberculous inflammation of bones and joints may present the same histological appearances, especially tubercles, like genuine tuberculous processes." The tuberculous inflammations are characterized by the peculiar arrangement of the cellular elements as well as by the histological development of the tuberculous tissue changes in general. On the other hand, there exist often enough certain marked peculiarities of the anatomical condition of non-tuberculous chronic inflammations of bones and joints so that they can be equally well distinguished from the tuberculous processes.

In his larger work, "Experimentelle und Histologische Untersuchungen über die Entstehung und Ursachen der Scrophulösen und Tuberculösen Gelenkleiden Nebst Studien über die Tuberculöse Infection und Therapeutischen Versuchen," Schüller has further shown that characteristic inflammations of joints can only be produced by means of tuberculous noxæ, and that he never succeeded in causing tuberculous articular inflammations by means of other inflammatory irritants. Where we find the histological appearances of tuberculosis in a joint, there exists, indeed, tuberculous disease. Notwithstanding this, there are individuals of general healthy appearance affected with "histological" articular tuberculosis who, after resection of the diseased articulation, make speedy recovery not followed by general tuberculosis.

Concerning chronic inflammations of bones and joints, from the clinical point of view there exist essential differences characteristic of the ætiological influences upon which the different inflammations are depending, but in some cases the differential clinical diagnosis may be very difficult and by no means reliable.

In chronic inflammations of bone and periosteum it may sometimes be doubtful whether they can be traced to an infectious disease of recent or remote date, or to a tuberculous process. Abscesses in consequence of periostitis or ostitis after acute infectious diseases generally take a favorable course without much general disturbance; they heal easily under proper treatment. But abscesses may arise caused, doubtless, by tuberculous osseous affections, in which, after opening antiseptically, complete recovery takes place without being followed by general disturbances ; in these cases, apparently, the tuberculous disease of the bone completely ended with the formation of such abscess.

Some difficulty may be experienced in distinguishing between tuberculosis and syphilis in certain forms of syphilitic inflammation of bone, especially in hereditary syphilis. But it should be remembered that tuberculous affections of the diaphyses are exceedingly rare, that more rarely still they appear at the same time in multiple form, that in them the periosteal new formation in the neighborhood is mostly very insignificant, that pus with cheesy particles is discharged, free from particles of bone, "carious" sequestra, as in syphilis, and that in cases of tuberculosis, the general condition is one of more or less suffering. Multiple chronic osteomyelitic affections in children and young persons, especially of the diaphyses, depend, as a rule, on hereditary syphilis, except in cases of acute infectious osteomyelitis and some acute infectious diseases which may easily be distinguished. When processes develop out of gummatous ostitis, leading to ulceration and expulsion of small sequestra, the general condition is either not disturbed at all, or to a less degree than in the more multiple tuberculous osseous affections. Although the syphilitic inflammations of bone and periosteum, as well as the acute osteomyelitis, are characterized by clinical symptoms like the tuberculous affections of bone, the experienced observer is not likely to confound the one with the other.

In chronic articular inflammations a differential diagnosis can be established by the main ætiological processes, even in those cases which present a certain external resemblance to tuberculous processes.

Schüller proposes, as others have done, to drop the old name "tumor albus" as doing no justice in regard to the ætiological, anatomical or clinical points of view, and as not identical with tuberculous swelling, though the majority of the articular affections, which used to be named thus, are of tuberculous nature. Chronic articular inflammations in children of from two or three years and until long after the years of puberty, are mostly tuberculous. Only after this period do we find non-tuberculous chronic inflammations relatively more frequent. In later years deforming arthritis appears with increasing frequency. Concerning the ætiological conditions under which the tuberculous articular inflammations develop themselves, Schüller refers to his above-mentioned work. Chronic syphilitic articular inflammations are, on the whole, extremely rare occurrences. They are peculiar in many respects, and easily to be distinguished from others, especially from tuberculous inflammations. The way they appear is quite characteristic, and they take a different clinical course from the tuberculous affections. Schüller gives an exhaustive symptomatology of this form as well as that of those rare articular inflammations which appear with acute infectious diseases, for which we have to refer to the original. Concerning the differential diagnosis, also, between arthritis appearing with or following acute infectious osteomyelitis we have to refer to the original.

Of gonorrhœal arthritis Schüller observed three cases—two of which became chronic. One of these cases was of the ankle, the other of the knee, and the third of the hip-joint.

In regard to the relation of chronic rheumatic arthritis to tuberculosis, he says: "If after a rheumatic arthritis a tuberculous arthritis sets in, it shows only that tubercular noxæ also have had influence." From his experiments and from clinical observations, he is inclined to believe that serous inflammations, as well as certain injuries of the joints, offer favorable conditions to tuberculous influences. For the name "rheumatic arthritis" he proposes the term "acute infectious arthritis."

Arthritis deformans, or, as it is called more properly by Hueter, "Polypanarthritis hyperplastica," appears with great frequency in certain districts, which makes it appear probable that there exists a general injurious influence; in favor of this assumption, also, is the fact that it frequently sets in after injuries of the joints, which injuries by themselves alone are not likely to lead to this form of arthritis. The anatomical changes of arthritis deformans, as well as its clinical symptoms, are so peculiar that it will hardly ever be confounded with any other form of arthritis.

The genuine gout, or rather "arthritis urica," is well known in regard to ætiology, and well characterized by clinical symptoms.

If after a simple subcutaneous injury to the joint, purulent or tuberculous arthritis sets in, there must have coexisted the influence of a certain noxa peculiar to these latter forms of inflammation. Schüller convinced himself, by numerous experiments, that if we injure the joint of a healthy animal by contusion ever so often, no purulent or tuberculous inflammation of such joint ever follows if the integument has remained intact and the animal has been kept in healthy surroundings —free from any accidental infection. Injuries of joints only lead to tuberculous inflammations when, either from other tuberculous organs of the individual or from outside, tuberculous infecting noxæ have entered the joint.

In resuming these ætiological views, he is of the opinion that the chronic inflammations of bones and joints, except those caused by injuries, are produced by a number of different injurious influences proceeding from the blood, and that they, corresponding with the different causes, appear in corresponding regular forms. Some of these forms are so well characterized by anatomical and clinical symptoms that from the latter alone a conclusion may be drawn as to their ætiology. Prominent among these are the tuberculous inflammations. A. Rose.

## ANIMAL LIGATURES.

Among the many recent advances in surgery that may be accounted permanent gain, the use of animal ligatures occupies a prominent place. We are under obligation to Mr. Macewen for his very interesting and instructive article in our last issue upon chromic gut and its uses in surgery. It comes to us in pleasing remembrance that to his fellow-countryman, the learned Dr. Thomas Young, of Edinburgh, we are indebted for the early modern suggestion that cat-gut would be a proper substance for sutures and ligatures. In his "Introduction to Medical Literature," published in 1813, he writes: "I have often wished to try ligatures of cat-gut which might be absorbed."

It is highly probable that the honor of first putting animal ligatures to the test is due the late Dr. Physick, of Philadelphia. His ligatures were made of chamois skin. Illustrating the old maxim, that "there is no new thing under the sun," we read the teachings of to-day in the Arabic works of the celebrated Rhazes, who practiced in Bagdad, A. D. 900; and again a century or more later in Albucasis, who wrote of the closing of abdominal wounds with lute strings, and of the stitching together of wounded bowels with fine threads made from the intestines of the sheep. Homer tells us in the Odyssey that the old Greek harp strings were thus made. In similar manner also was strung the harp of the ancient Egyptians, and it is very probable cat-gut ligatures were not unknown at the time of the Pharaohs. We are, however, largely indebted to Mr. Lister for the more general introduction and improvement of cat-gut ligatures. This followed as a sequel to his studies and conclusions upon the repair of wounds placed in a condition to prevent putrefaction. Under his enthusiastic following, many have contributed in the demonstration of the value of animal ligatures for widely varying purposes and in variety of form and material.

For twelve years we have ourselves used animal ligatures for almost every purpose demanded in surgery, and for the first half of this period with perfect satisfaction. Until then we had used only the gut prepared in Glasgow; but experimentation with different kinds of gut, of our own and others' manufacture, led to the conclusion that there was reason for much dissatisfaction, and we could easily understand why many excellent observers, after a few trials with imperfect material, condemned animal ligatures as entirely untrustworthy. The gut prepared in Italy is deservedly the most highly prized by musicians. This is made from an animal more active and less fat than our ordinary domestic sheep; the connective tissue of the intestine is thus much more free from fat and is stronger, yet in the process of manufacture it is sharply twisted, and after drying is generally sandpapered for the production of a cord which shall be of even thickness, and is much weakened by thus cutting its fibres. This process obviously injures it for surgical purposes. Many specimens examined after maceration show, in the cross cutting of the fibres and irregular surfaces, good cause for yielding under strain in the tissues, although capable of high tension in the dry state. This has caused other material to be sought, and it has generally been found in the parallel bands of connective tissue which make up the tendons of all animals. These are at present in great variety.

The serious objection to all the specimens from the domestic animals, is that they are materially weakened by fatty infiltration. The ox tendon, dry, will frequently break transversely. Those which we have found most satisfactory are from the moose or caribou from northern Maine. These very lean, large, strong and active animals furnish tendons of sufficient length which are easily divided as finely as may be desired, are free from fat and very strong. Under the same manipulation these soften less readily in the tissues than gut, and are prepared by a method similar to Mr. Macewen's and Mr. Lister's. The whale tendon is spoken of enthusiastically by those who have used it. Recently in London our attention was called to the excellent tendons from the tail of the kangaroo, and only a few days since Dr. T. G. Simons, of Charleston, S. C., sent us some exquisitely beautiful specimens of fine fibres from the tail of the large southern fox squirrel, which he writes us he has used with the greatest satisfaction. Histological studies of the tissues at various periods after the ligature has been buried in them, lead us to believe that instead of undergoing absorption they are either transformed into, or more probably replaced by fibres of vitalized tissue. In one instance, more than four months after introduction, we were able to demonstrate their outline as bands of connective tissue, yet intimately blended with the surrounding parts. A similar occurrence probably takes place about an occluded vessel. If this is true, it has an important surgical significance. Thus in aneurism we not only occlude the vessel, but we still further protect from a return of the disease by living bands of constricting fibre. Especially have we felt this important in the operation for the cure of hernia which we originated years ago, consisting in carefully occluding the exposed ring with a continuous suture of animal fibre, which is pocketed under antiseptic precautions. Months after the operation the thickened tissues are readily demonstrated about the occluded ring, and certainly this adds much to the safety of the patient against the return of the hernia. In the removal of the uterus and fibroid tumors we have not hesitated to trust the control of hæmorrhage to a tendinous suture, the opposing ends of the ligature being introduced by a needle without cutting edges through the same opening (shoemaker's stitch), and thus with double thread firmly sewing the pedicle through and through. Knowing the importance of careful adaptation of the peritoneum after gastrotomies, we have first closed the edges with over and over stitches with tendon, and then the abdominal wound in the usual manner. Since adopting the animal ligatures prepared as above described, we do not recall a single instance when their use has been regretted. HENRY O. MARCY.

## LUCAS-CHAMPIONNIERE ON ANTISEPTIC SURGERY.[1]

It may be boldly asserted that no surgeon has lived, since John Hunter, who has done so much for the advancement of surgery as Prof. Joseph Lister; and consequently the value of this book to the profession may be justly estimated by the words of its author, who, in his introduction (p. 15), says: "I assert more emphatically than ever that we can do no better than to remain faithful to the words of the Master; and that I may deserve to be considered elsewhere, as I am already in the Surgical Society, his apostle, I promise those who shall obey them the following things: The disappearance of wound accidents even in the worst circumstances. A regularity in repair hitherto unknown. Surgery without suppuration. Union by first intention habitually and without danger. Such rapidity in healing as to surpass all anticipation. The possibility and safety of operations hitherto considered dangerous and even unjustifiable."

The complete fulfillment of this promise to all who *strictly adhere* to Lister's system of wound treatment no longer requires verification; but the various details attending this treatment have never been heretofore fully described in any book in the English language, and consequently those surgeons who have endeavored to practice this system have been compelled to search through many volumes of dusty journals frequently without finding the desired information—unless able to read the French or German works on this subject. The book before us fully supplies this want, and will enable those surgeons who attempt to apply antiseptic principles to the treatment of wounds to follow it out intelligently in all its details, and thus secure the grand results which can only be obtained by perfect work.

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[1] Antiseptic Surgery. The Principles, Modes of Application, and Results of the Lister Dressing. By Dr. Just Lucas-Championniere. Translated from the second and completely revised French edition, and edited by Frederic Henry Gerrish, A.M., M.D. 8vo, pp. 239. Portland: Loring, Short & Harmon.

The author condemns all imitations or so-called modifications of Lister's system of wound treatment, although willingly admitting that the results of the surgery of all these imitators are vastly improved ; he evidently, nevertheless, thinks them still very unsatisfactory. The first chapter of the work considers briefly the progress of surgery, practices designed to defend wounds from the injurious action of the air, occlusion and antisepsis in ancient and modern times, and also the method of Lister. The second chapter presents the theoretical views on which the practice of the dressing is based, and the thirty-third is devoted to the formulas for preparing the materials employed in the true Lister dressing, while in the intervening chapters there may be found minutely detailed the operative procedures and essential practices which will enable the antiseptic surgeon to adapt the Lister system of wound treatment to every part of the body.

The careful preparation and revision which this book has received at the hands of the author, and the excellent translation of the original into classical English, gives little opportunity for adverse criticism. It is, however, to be regretted that the work has not been fully and carefully illustrated, which would enable a busy surgeon to understand at a glance the views of its author ; and, furthermore, the ninth chapter, which is devoted to the antiseptic spray, does not embody the most modern views on this subject ; but, nevertheless, the value of the book is so great in the present state of our surgical literature, that it should find its way into every surgeon's library. The antiseptic surgeon cannot afford to be without it, since to him it is a chart and compass in the daily performance of his labor. Nor can the imitators afford to be without it, since familiarity with all the characteristics of the genuine is absolutely necessary in order to be able to produce a good counterfeit ; and even those who have no settled opinions on this subject should certainly feel prompted to read it by a sense of duty to themselves and their patients if engaged in the treatment of wounds, inasmuch as it is the best exposition of antiseptic surgery in our language. B. A. WATSON.

# ABLATION OF THE TONGUE, WITH SPECIAL REFERENCE TO THE BEST MEANS OF CONTROLLING HÆMORRHAGE FROM THE LINGUAL ARTERY.[1]

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THE first recorded amputations of the tongue were not performed for the removal of disease, but were intended as a punishment for real and imaginary offences against Church and State. And if the histories of these wholesale and barbarous operations are authentic, the operators could furnish much better statistics than we can at the present day. It is very probable, however, that in most of these amputations the principal part of the tongue was left behind, and that the main trunk of the lingual was not involved in the incision.

From the year 1695, when Hoffman performed his famous amputation of the tongue with a chisel, and suppressed the hæmorrhage from the open vessels by means of a red-hot iron, each and every operation has been changed and modified with a view to diminish the risk of bleeding from the lingual artery. While I think the danger from that source is somewhat exaggerated, yet deaths have occurred in the best hands from that cause alone; and when the bleeding has not put an end to life while the patient was yet in the surgeon's hands, it has often been so abundant as to materially lessen the chances of a good recovery.

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[1] Abstract of a paper read before the New York Surgical Society.

The various means employed at the present day for controlling the hæmorrhage during the operation, necessarily include a brief description of each variety. They are:

1. Ligature of the lingual artery at its origin.
2. Ligature of the lingual artery in the digastric triangle.
3. Double ligature of the base of the tongue.
4. Acupressure.
5. Removal of the tongue with the écraseur.
6. Removal of the tongue with the galvano-cautery.
7. Insertion of caustic arrows.
8. Syme's, Sedillot's and Langenbeck's operations in which the jaw is cut through at different points as a preparatory step to excision.

Ligature of the lingual artery between the external carotid and the posterior border of the hyo-glossus muscle was recommended by Demarquay in order to retard the growth of cancer and to diminish the pain and excessive secretion of saliva, and it has also been performed in connection with Hilton's and Moore's operation (division of the gustatory nerve) with the same object. Mirault was the first to ligate the artery at its origin as a preliminary step in extirpation of the tongue. In this country the only recorded cases that I am aware of are those performed by Dr. Shrady, of this city, and myself. In Dr. Shrady's case the cancer occupied one side of the tongue, and only one lingual artery was ligated and the diseased side of the tongue removed. The following cases in my own practice illustrate fully the difficulties and dangers of the operation, as well as the benefits which arise from its performance:

John Dean, aged 70, occupation harness-maker, was admitted to St. Francis' Hospital, September 17, 1878, suffering from epithelioma of the tongue. The disease commenced eight months previous to admission as a small fissure or ulcer on the left side of the tongue near the lip. It spread rapidly in depth and circumference, and was accompanied by great pain and difficulty in mastication and deglutition and obscure articulation. An examination showed that a large, deep and irregularly excavated ulcer occupied the left side of the tongue extending from its anterior extremity to within three-quarters of an inch of the insertion of the palato-glossus. The whole organ was much swollen, and hard and painful to the touch. Large quantities of saliva mixed with pus flowed constantly from the mouth. The odor was extremely fetid, and very noticeable some distance from the patient.

A few days after admission it was seen that the disease was spreading rapidly, and had already involved the right side of the tongue near the floor of the mouth, and undermined the greater portion of the left side. There was every indication that the lingual artery would soon become involved in the destructive process, and that fatal hæmorrhage from that source might occur at any time. It was decided, therefore, upon consultation, to ligate the linguals near the origin. On September 30, assisted by Drs. Ripley, Stimson and Shrady, I performed the operation in the following manner: A curved incision was first made on the left side of the neck, extending from the anterior extremity of the hyoid bone to about an inch beyond its greater cornu; the integument, superficial layer of fascia, platysma and deep fascia being divided, the submaxillary gland came into view; this was carefully raised and held upwards by a tenaculum.

Careful dissection at the posterior border of the hyo-glossus muscle over the greater cornu of the hyoid bone brought the artery into view about half an inch above the cornu—its normal but by no means constant position; a cat-gut ligature was then applied to the artery, and the wound closed with cat-gut sutures.

An incision somewhat similar was then made on the right side of the neck, and carried down to the apex of the cornu; here the artery was given off from the carotid about an eighth of an inch higher up than on the opposite side, and more dissection was made to expose the vessel clearly, as some of the gentlemen present thought it was the facial, and even believed that they controlled the pulsation in the facial by pressing on this artery. When it was acknowledged beyond a doubt that the artery was the one we were in search of, a cat-gut ligature was applied and the wound closed in the usual manner. The patient's condition at this time was excellent, and it was therefore decided to extend the operation and remove the entire tongue and the diseased tissue in the floor of the mouth. A vulsellum was applied to the apex of the organ, firmly held and drawn out of the mouth as far as possible by assistants; the attachment of the genio-hyoid and genio-hyo-glossi in front were then severed. This allowed the tongue to be carried a much greater distance out of the mouth than before, and its root much more easily reached. A stout ligature was then passed through the anterior extremity of the tongue near the median line, and extension of the organ maintained by this instead of the vulsellum; in order to give greater room for cutting near the upper border of the hyoid bone the anterior pillars of the fauces were next divided, and then the tongue was cut through at its base and removed entire.

The operation was a bloodless one in every sense of the word, except when the anterior pillars of the fauces were cut through, when slight oozing occurred. This was easily controlled with a piece of ice.

On the second day after the operation the patient's temperature ran up to 103°; on the fourth day the thermometer registered 101° in the mouth; on the fifth day he was able to get out of bed and help himself to various articles in the room. His food was administered by means of a catheter inserted into the œsophagus, and was retained without difficulty. He was remarkably free from pain. On Sunday, the sixth day after the operation, he remained out of bed the best part of the day and attended to all his own necessities; the wounds in the neck seemed to be healing rapidly, and there was every prospect that he would make a good recovery. On the morning of the seventh day he aroused his nurse by a loud cry; the nurse ran to his bedside and found that a large stream of blood was spurting from the posterior corner of the wound on the right side of the neck; he was unable to control the hæmorrhage, and death resulted in a few moments from the time he was first called.

A post-mortem examination showed that the lingual artery on the right side had sloughed from its point of origin at the external carotid to within a couple of lines beyond the point where the ligature was attached ; on the left side the ligature was intact, and a firm clot filled the artery on both sides of the ligature and extended about the eighth of an inch into the external carotid artery. There was no disease in the neighborhood of the ligated artery which would account for the secondary hæmorrhage ; the artery was ligated at a sufficient distance from the carotid to insure the formation of a clot ; there was no calcification or atheromatous degeneration of the vessels on that side of the neck. The secondary hæmorrhage was therefore probably due to the extra amount of dissection which was made in exposing the artery on that side, and which cut off the blood supply to the walls of the blood vessels. In a younger person the destruction of cellular tissue around the artery to the same amount would probably have been unattended by evil consequences, but in an old man, whose nutrition was much below par, little was needed to cause necrosis of tissue anywhere.

In case No. 2, in which I also tied both lingual arteries at their origin, there was great pain, salivation and general discomfort, and the operation was performed principally for the removal of those conditions. Drs. Ripley and Bryant coincided with me in the opinion that owing to the large involvement of the glands at the floor of the mouth, the removal of the tongue should not be attempted.

The history furnished by Dr. Haupt, House Surgeon of St. Francis' Hospital, is as follows:

Thos. Kennedy, aged 35, a native of Ireland, by occupation a laborer, was admitted May 21. Seven weeks previous to admission, he noticed a small sore on the under surface of the tongue on the left side, which gradually spread until it involved the whole left half of the organ, accompanied by considerable induration beyond the median line and by great pain. Within four weeks from the time of admission the cervical and sub-maxillary glands became very much enlarged, and by pressure on the nerves occasionally produced dyspnœa. On May 31 the patient was etherized with considerable difficulty, owing to the dyspnœa which accompanied the narcotic effects of the ether, and which, throughout the whole operation, added much to the difficulty of exposing the lingual.

The incisions in this case were similar to those previously described, with the exception that they were extended posteriorly an inch more so as to expose the external carotid and the whole triangular space in which the lingual artery is situated. Owing to the extensive glandular enlargement the ordinary anatomical relations were lost, and much greater difficulty was experienced in reaching the arteries than in the previous case; indeed, I was not positively certain that the arteries had been ligated until I cut off the end of the tongue after the operation. The absence of bleeding then settled the question beyond a doubt. On June 1, the day following the operation, his general condition was extremely bad; he suffered greatly from dyspnœa, his pulse was weak, rapid and dicrotic, and he seemed to be sinking rapidly; I saw him in the afternoon and found him in a cyanosed condition, and apparently dying; I immediately opened the larynx and introduced a canula. This operation was followed by immediate relief and, in an hour or so, by the disappearance of nearly all the unfavorable symptoms. In ten days the tube was removed and the opening allowed to close; the tongue as well as the enlarged glands diminished in size; the pain lessened; his appetite returned, and at the end of three months he left the hospital, not by any means well, but comfortable. He remained at home until his death, which took place three months subsequently from an extension of the cancerous disease.

While ligature of the linguals in the first case rendered the subsequent extirpation of the tongue entirely bloodless, and in the second case reduced the size of the tongue, diminished the suffering and improved the patient's general condition for a time, I am not certain that the operation is a justifiable one, except in cases where there is deep ulceration in the floor of the mouth and impending death from hæmorrhage.

With regard to ligation of the lingual in the digastric triangle, I do not think it can be of any special benefit where the whole organ is to be removed, as considerable hæmorrhage may still arise from the arteries in the dorsum. In cases where the disease only includes the anterior half of the tongue it might be of service, and would probably not diminish the patient's chances of recovery.

*Double ligature* of the base of the tongue has been employed with success by Arnolt, Mirault and Mayer. The latter first divided the tongue in the median line from the tip to the base without involving the arteries in the incision; a strong ligature was carried around the diseased portion of the organ and the ends of the "noose" passed through a "knot-tightener," by means of which the noose could be tightened daily, cutting gradually its way out and thus amputating the diseased portion.

In 1839, Arnolt tied the portion to be removed above the hyoid bone, as well as in the mouth.

Mirault passed a strong double ligature from before backwards through the centre of the tongue to the epiglottis, then constricted the parts by tying the knots on each side. Mirault, Jr., used the ligature for the same purpose, but in a different way. He passed the ligature through an opening midway between the chin and hyoid bone, encircling the tongue and bringing the ends of the ligature out again through the external wound.

All these operations by ligature, though securing the patient against the danger from hæmorrhage, are excessively painful and tedious and accompanied by so much fetor that they may be excluded without loss from our list of operative procedures for ablation of the tongue.

*The insertion of caustic arrows* is permissible only in small tumors. The diseased is completely isolated from the healthy tissue by piercing the part through and through with the caustic, allowing it to remain long enough to destroy all the blood supply to the part. This operation, also, may be omitted on the same grounds as the previous one.

Ordinary *acupressure* may be employed with benefit where small and superficial portions of the tongue require removal. The needle may be inserted transversely or longitudinally; the direction, of course, depending on the location of the disease. When the needles are in position, a wire is passed from one protruding end to the other over the tissues including the artery, and fastened tightly enough to constrict every part, until the diseased portion is removed with the knife and the cut vessels ligated.

Removal of the tongue with the écraseur is an operation which has been attended with great success, both as regards freedom from hæmorrhage and the percentage of recoveries. Indeed, judging from the reported cases, it has proved more successful in every way than any other operation on record. For instance, Nunneley reports nineteen consecutive cases with but one fatal result. In using the écraseur he made an opening under the jaw midway between the symphysis and the hyoid bone, passed a needle armed with the chain into the mouth at the frenum; two curved needles were then inserted from before backwards on each side of the median line, and carried backwards to the base of the tongue; the chain of the écraseur was then passed behind and under the needles and fastened; the screw was then tightened slowly, very slowly indeed, something like two minutes interval being allowed to elapse between each turn, until at the end of about an hour the tongue was cut completely through.

Paget modified the operation by leaving out the submaxillary puncture, and operating in the same manner through the mouth. He had excellent results also.

The galvano-cautery is also recommended as a substitute for the écraseur, especially with a view to prevent hæmorrhage. I have not had much experience with the galvano-cautery in removing diseased tissues, but the little experience I have had leads me to doubt its availability in preventing hæmorrhage from the lingual artery. I have not found it efficient in closing up blood-vessels of ordinary calibre, though employed at a red heat as recommended by those who favor its use. Under all circumstances I should prefer an artery-forceps and a few stout ligatures to the galvano-cautery if any vessels of medium size were to be cut open during an operation for the removal of cancerous growths.

Besides the operations to which I have given brief mention, we have a series of procedures which have for their object easy access to the artery from without, such as Syme's and Langenbeck's. Syme's operation consists in first splitting the lip in the median line and carrying the incision as far as the hyoid bone, drawing back the flaps, sawing through the inferior maxillary at the symphysis, separating the fragments and exposing the base of the tongue. The tongue is drawn forward, and an incision made from before backwards in the floor of the mouth. As soon as the linguals are severed they are seized with the forceps and tied, when the rest of the organ down to the epiglottis is removed without any further danger from hæmorrhage.

Langenbeck modified Syme's operation by making an incision from the angle of the mouth downwards and back wards and then splitting the jaw on the side near the site of the lingual.. An incision was then made on the *side* of the tongue and the artery seized as in the previous case. This operation has the advantage over Syme's, in that the flow of blood from the lingual would take place entirely outside of the mouth, none of it could get into the throat, and the ligature of the artery would be much more easily accomplished.

Both operations are, however, attended with greater risk to life than any of the others mentioned. They are not necessary for the prevention of hæmorrhage, and unless in exceptional cases should not be resorted to.

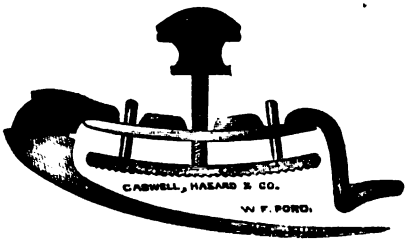

FIG. 1. "SAFETY-PIN" LINGUAL TOURNIQUET.

In the Fall of 1879 I employed some ordinary safety-pins in compressing the penis during amputation of the penis, and found them exceedingly useful in controlling the hæmorrhage. Since that time I have employed modifications of the safety-pin in other operations, and have devised, among others, what might be termed a "safety-pin tourniquet" for compressing the lingual artery. I have used it on the cadaver with ease, but have not yet tried it on the living subject, so that its merits remain to be tested. It consists of a heavy steel pin with an ordinary safety-pin "catch," but much more movable at its attached end. To the external bar inside there is a second movable bar one inch and a half in length, worked by a screw on the external surface. The point of the pin is entered at the floor of the mouth opposite the second molar tooth, and pressed downwards and inwards towards the median raphe of the tongue; when near that locality the point of the pin is turned directly backwards towards the foramen cæcum; reaching that point in front and to one side, its point is directed to and brought out at the point of attachment of the anterior pillar of the fauces, inner edge; the pin is then closed and fastened, the screw turned, and the movable bar of the tourniquet pressed firmly down on the root of the tongue, including the main trunk of the lingual artery. An incision is then made on the compressed side of the tongue as far as the median line, exposing the arteries, which should be immediately tied before proceeding with the remaining part of the operation. Another "safety-pin tourniquet" may now be applied to the other side of the tongue in a similar way without disturbing the one already on, but when the arteries are tied the first one can be removed and applied to the other side, so that there is no real necessity for employing two.

If this pin, which in its method of application is a combination of the acupressure and tourniquet principle, will close the arteries on the living subject as well as it does in the dead, I am satisfied that extirpation of the tongue will be rendered an exceedingly safe and simple operation.

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# THE SURGERY OF THE PERICARDIUM.

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THE operative procedures that are permissible upon the pericardium are aspiration, injection of antiseptic solutions, and incision either as a diagnostic or therapeutic measure. A few years ago simple aspiration was regarded with suspicion, injection considered quite improper, and incision with the introduction of a drainage tube looked upon as too hazardous to be even mentioned. Investigation, experimentation, and clinical experience, however, have shown that these operations are not only justifiable, but are attended with brilliant results. I, therefore, desire to briefly call attention to some practical points in pericardial surgery.

In all cases of pericardial effusion that present dangerous symptoms of heart failure, aspiration should be performed as soon as it is evident that medication is not lessening the embarrassment of the central organ of circulation. It is bad practice to delay the operation until exhaustion, pulmonary engorgement and degeneration of cardiac muscle render permanent relief impossible. In nearly all instances the tendency is to wait too long, instead of operating promptly and affording immediate relief. Clinical experience has abundantly shown that when the pericardial fluid is evacuated the dyspnœa, cyanosis, irregular pulse and other threatening symptoms are lessened, and usually at once. The time for operation depends less on the amount of fluid than would at first be supposed, because the sudden effusion of a moderate amount of serum will exert more pressure upon the heart than a much larger quantity poured out in so gradual a manner as to allow the pericardium to become stretched. Hence I say: "Aspirate in all cases of effusion, in which dangerous symptoms of heart embarrassment occur, as soon as medication fails, without regard to the supposed quantity of fluid."

If there coexists pleural effusion of considerable amount, the pleural sac should be aspirated first, because it is difficult to discriminate between respiratory distress due to pulmonary pressure and that resulting secondarily from interference with cardiac action. This rule applies to pleurisy of the right side as well as of the left.

When the amelioration of symptoms following pericardial aspiration is not permanent, because reaccumulation takes place, the operation should be repeated. It is better to vary the point of puncture lest, on account of adhesion of the layers of pericardium at the original point, the heart be wounded at the second tapping. Should repeated tapping be demanded I should be inclined, after the third operation, to inject some irritating fluid, such as tincture of iodine, into the sac, with the idea of producing adhesion of the two layers of the pericardium. Universal pericardial adhesion is found after cure by simple tapping, and injection has been done without preventing, or apparently interfering, with recovery. The fluid injected ought probably to be concentrated, as the object to be obtained is a pericarditis which will furnish plastic lymph instead of serum. Carbolic acid undiluted, as used in hydrocele, would be the proper agent, were it not for the possibility that its contact with the heart walls might induce cardiac spasm.

When aspiration has shown the pericarditis to be distinctly purulent, it is almost certain that repetition of the operation will be demanded. If a second tapping is required, the introduction of a carbolized drainage tube, after a free incision has been made, strikes me as the most judicious kind of surgery. The cavity can be washed out daily with antiseptic solutions, and purulent accumulation, with its attendant dangers of pressure on the heart and septicæmia, avoided. This line of treatment has been advocated by me since 1876,[1] and although I am opposed by the opinion of many distinguished writers and teachers, I cannot but believe it the proper course to pursue in such cases. Empyema is known to result most favorably when so treated, pericardial fistulæ seem no more dangerous than pleural fistulæ, and pus allowed free egress from serous cavities under antiseptic precautions, is much less disastrous in its effects than when partially removed by the repeated use of the aspirator.

My opinion, which was founded on these facts, has received confirmation in the recent case reported by Rosenstein,[2] who, after withdrawing 620 cubic centimetres of pus by the aspirator, was compelled to repeat the operation. As the fluid again reaccumulated, an incision, about three centimetres long, was made, with antiseptic precautions, between the fourth and fifth ribs, near the left edge of the sternum, and two drainage tubes were introduced. The wound was dressed according to Lister's method. Cicatrization occurred in less than three weeks (January 30 to February 19), and there were no further pericardial troubles. Left pleuritis coexisted, which was treated also by aspiration, followed subsequently by incision. The patient was finally discharged cured. No better illustration of the value of the method advocated could be furnished; for not only was a pleuritic, but also a pericardial effusion, treated and cured by incision, after failure of aspiration.

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[1] *New York Medical Journal*, December, 1876. See also Paracentesis of the Pericardium, by John B. Roberts, 8vo., Phila., 1880.

[2] *Berliner klinische Wochenschrift*, No. 5, January, 1881.

Incision may be useful as a diagnostic procedure in cases where doubt exists between a large pericardial effusion and a dilated heart. The dissection down to the pericardium, if made carefully, will scarcely increase the danger if dilatation be the pathological condition, but will save life if effusion be the cause of the threatened dissolution. In Vigla's case, upon which Roux operated because effusion was suspected, incision disproved the diagnosis and showed the existence of cardiac dilatation, from which the patient died, but without reference to the operation.

In cases of foreign body in the pericardium, incision would be justifiable for the purpose of removal, even if resection of a costal cartilage was required, to give opportunity for manipulation. The time may possibly come when wounds of the heart itself will be treated by pericardial incision, to allow extraction of clots, and perhaps to suture the cardiac muscle. Autopsies have shown a considerable amount of repair going on after wounds of the heart, and life is frequently prolonged many days after the receipt of such injuries. Perhaps a less expectant treatment would give more favorable results than those usually obtained. Puncture of the heart has been repeatedly done without injurious consequences.

Dr. L. A. Sayre[1] has reported a case of gunshot wound of the chest, in which the laceration laid open the pericardium so that the contused heart could be seen. Recovery followed, and four years later no sign of cardiac disease was present.

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[1] Bulletin New York Pathological Society, January and February, 1881.

The best point for aspiration of the pericardium is in the fifth interspace just above the sixth rib, about 5 or 6 centimetres (2–2¼ inches) to the left of the median line of the sternum. In a child it should be nearer the sternum. This point is outside of the line of the internal mammary artery, is in a wide portion of the intercostal space, corresponds with the notch in the border of the left lung, is low enough to preclude wounding auricle and high enough to avoid the diaphragm, and does not approach the point where a cartilaginous band usually joins the fifth and sixth cartilages. Both layers of the pleura will probably be pierced by the aspirating needle at this point, but this is not an important complication, and can only be avoided with anything like certainty by going close to the sternum, which is objectionable on other grounds.

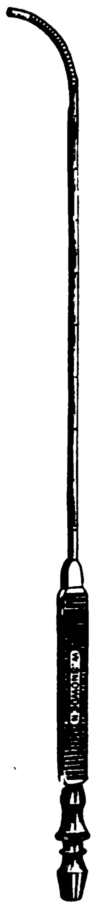

FIG. 1. ASPIRATING PERICARDIAL TROCAR.

The ordinary aspirating needle, or the aspirating trocar which I here exhibit, may be employed. In all cases the vacuum should be attached to the needle or trocar as soon as its point is buried beneath the skin, in order that the flow of fluid may indicate the moment when the pericardium is entered. The instrument should be, of course, clean and, I think, anointed with carbolized oil.

The aspirating trocar which I have devised for the purpose, and which I believe to be well adapted to the requirements of pericardial tapping, consists of a moderate sized aspirating needle, flattened at its upper extremity to give the surgeon a firm hold, within which slides a canula. The distal end of the canula, made flexible by a spiral, when thrust beyond the point of the needle curves downwards, and thus prevents the point of the puncturing instrument injuring the heart when the fluid is nearly evacuated. During penetration of the thoracic wall the canula is retracted so that the flexible end is contained within the needle. The perforation at the end of the canula allows fluid to escape as soon as the pericardial sac is entered. The canula is then thrust forwards until the sharp point of the needle is guarded. This movement brings a lateral fenestra in the canula opposite a similar opening in the needle, and thus provides a second orifice for the escape of fluid in case the terminal one becomes occluded. The external end of the canula has a square shoulder to prevent rotation within the needle, and terminates in an enlargement for attachment to the tube of the aspirator. The needle, or outer canula as it may be called, is marked on the surface to show the number of centimetres concealed in the tissues. If the inner canula is suspected to be clogged with lymph-shreds or pus, it can be withdrawn without disturbing the needle; and the attachment of the pump may then be made to the latter as if it were an ordinary aspirating needle.

This instrument, in my opinion, is preferable to the ordinary aspirating needle, because, while it can be used as such, it renders abrasion of the heart impossible. It is an improvement on Fitch's dome-shaped trocar, because that has no terminal perforation to show, by escape of fluid, when the sac is entered.

# ON DOWELL'S METHOD FOR THE RADICAL CURE OF HERNIA.

By OSCAR H. ALLIS, M. D.,
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DURING the Centennial, Greensville Dowell visited Philadelphia. He had come north with the threefold purpose of visiting the great exhibition, publishing works on hernia and yellow fever, and, if the way opened, to establish himself in the city. He was nearing his one hundredth operation for the radical cure of hernia by a method devised by himself, and he felt that the time was auspicious for issuing a treatise upon the subject. While preparing his work he had a few opportunities of demonstrating the beauty, ease and safety of his operation, and careful surgeons readily expressed themselves quite enthusiastically in its favor.

In due time the work appeared; but the criticisms of the medical press were so uniformly unfavorable that the first is likely to be the only edition. Had the author contented himself with a pamphlet, descriptive of his method of operating, it is not unlikely that its merit would have been recognized. His ambition was, however, to produce a work on hernia, and to do this he must describe its formation, varieties and palliative treatment; its anatomy and surgical treatment when strangulated; as well as the history and various plans devised for its radical cure. Very little in all this could claim originality, and all that could keep such a work afloat would be superiority in authorship. This, unfortunately, was wanting, and the main object for which the book was begun—viz., to exhibit his own operation—met a fate far beneath its merit.

As to the operations he performed in our hospitals they were carefully watched, and as the patients rose from their beds in a fortnight without a symptom of their former malady, great interest was awakened. Months, however, passed, the ruptures returned, and I feel that I say nothing amiss in declaring that to-day both book and method are practically forgotten.

It was my good fortune to receive private instruction from him upon the cadaver; while his views of its safety and his plan of treatment were quite fully imparted to me in repeated visits at my office.

For the performance of his operation a needle and ligature are alone required. The needles are curved, double-pointed with an eye at either extremity, and about three inches long. They can be obtained in New York from Tiemann, and in Philadelphia from Gemrig, and I will therefore omit a cut of one. The ligature passes through both eyes. Let us now suppose a patient to be lying before us, and the operation to be upon a left inguinal hernia. The surgeon standing at the patient's left, explores the condition of the external ring by invaginating the scrotum with the left forefinger. By this means the exact position and size of the ring can be mapped out. For ease in demonstration, let a star be made in ink directly over the ring, and lines be drawn in the direction of the inguinal canal, one at the outer and another at the inner border of the ring. (See straight lines and star, Fig. 1.) The needle is now entered at the star, carried into and along the superficial fascia, and brought out at the outer line. (See direction of the needle as indicated by

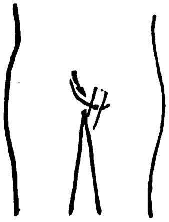

FIG. I. FIRST STEP; INTRODUCTION OF THE NEEDLE.

the arrow.) The needle is now pushed forward until its terminal end has disappeared at the point of entrance—*i. e.*, at the star; but care must be taken not to entirely withdraw it. The left forefinger again invaginates the scrotum and is carried to the entrance of the ring where, by its presence, it can feel and superintend the course of the needle, which is now reversed in its course and directed through the external pillar—through the neck of the hernia, through the internal pillar, and made to reappear at the internal line. (Note direction of arrow, Fig. 2, as contrasted with the arrow in Fig. 1.) The third step is now to withdraw the needle at the inner line until its point has escaped the internal pillar, when the needle is again reversed, carried to the star where it originally entered, and then entirely withdrawn. (Note again the direction of the arrow, Fig. 3.) It will thus be seen that the needle has entered directly over the point of rupture, traversed both pillars and the neck of the hernia, and reappeared at the point of entrance without having been entirely withdrawn.

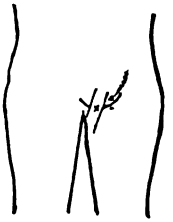

FIG. 2. SECOND STEP; NEEDLE REVERSED.

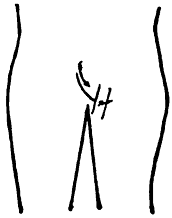

FIG. 3. FINAL STEP; NEEDLE AGAIN REVERSED AND BROUGHT OUT AT ORIGINAL POINT OF ENTRANCE.

Professor Dowell was in the habit, in tall adults, of putting in three ligatures about a half inch apart, though he often contented himself with two. Having passed his silk ligatures, he attached silver wires to them, drew these through, tightened and twisted them, when the operation was complete. The dressing was a simple covering to exclude the air, and the patient subjected to quiet recumbency. At the end of four days he usually removed the silver wires. He always carefully watched their action, promptly removing them on the slightest indication of suppuration. There was usually so little soreness during and subsequent to the operation that often in less than a fortnight he permitted his patients to leave their beds and go about without any truss, and with the single precaution not to attempt violent exercise.

To one familiar with the predisposing causes of hernia, it will not be surprising that the *cures* effected in our city were only temporary. To the neglect of proper after-treatment, and not to any lack of merit in the operation, is due, I believe, their failure. Had prolonged recumbency been first enjoined, and then the employment of a well-adjusted truss, the result would have been more satisfactory.

Having thus described the method of Prof. Dowell, I will venture to add my own experience. Instead of a double-eyed needle, I prefer a similar one with a single eye—the eye being in the middle. With such a needle the eye can be exposed and threaded without danger of removing the entire needle, while with the double-eyed needle the eye is too near the point to do this. Instead of a single ligature with equal ends, a double one, with the loop on one side and the two equal ends on the other, will be found convenient, since, after the needle has gone its course and been withdrawn, the loop in the silk ligature will be found convenient in attaching and drawing through the silver wire. Professor Dowell did not fear peritonitis. He had never witnessed it in any of his cases. He withdrew his ligatures early, as his object was to obtain adhesive inflammation, and the first appearance of pus was the signal for the removal of the ligatures. Whether in the failure the gut makes its way through the old channels or not I cannot say, but such would seem to be the case. My own experience has demonstrated that there is nothing lost in leaving the wire in a week or ten days, or even to cut its way out. Professor Dowell employed three ligatures, or two in short adults. I am of the opinion that the one at the mouth of the sac is the all-important and only necessary one. Lastly, the truss should supplement the cure, and if the operation has made the employment of a truss comfortable, it has done all that could reasonably be required of it. So far as my limited experience goes—and I have operated five times since meeting Professor Dowell—I believe the needle operation as simple a device as could be desired; remarkably free from danger, not a death in over a hundred operations, and capable of doing all that can be done by operative measures. I would never consent to operate where a truss could comfortably prevent protrusion; but when this is impossible, I should feel justified in recommending subcutaneous ligation.

Professor Dowell used his needle in the ligation of varicose veins in a way singularly ingenious and really too good to be lost. Over a distended vein he made a dot with a pencil, and then drawing upon the skin he removed the dot to the side of the vein. He now punctured this dot in the skin, and into the puncture inserted his needle, which he carried beneath the vein, making the counter puncture at any convenient point. He now withdrew the needle until its terminal point had escaped the vein, when he reversed its direction, bringing it out at the point of entrance.

I have used his needle also in varicocele. As the operation is especially adapted to clinical instruction, I will decribe it:

The spermatic duct is first isolated, the needle passed below it, the ligature withdrawn and tied loosely, as in Fig. 4. The needle is again withdrawn until its point is within the scrotum, threaded with a second ligature at B, carried *in front of the veins*, and made to escape at C. One end of the ligature is now drawn from the eye of the needle. Withdrawing the needle

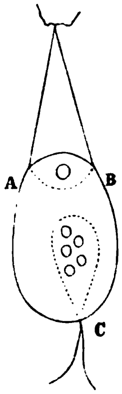

FIG. 4. THE USE OF THE NEEDLE IN VARICOCELE.

until its point is above the veins, it is threaded with the remaining end of the ligature and carried *behind the veins* to the point C, where the ligature is withdrawn and the needle removed. It will now be seen that the duct and veins can be widely separated and held so until every one present is satisfied with the operation. The veins are now ligated and the duct set free.

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# A REPORT OF TWENTY CASES OF INJURY TO THE HEAD, WITH REMARKS.

By JOHN C. SCHAPPS, M. D.,
OF BROOKLYN, N. Y.

NOTHING is more characteristic of injuries to the head, as compared with those to other parts of the body, than the marked individuality usually presented. This lack of common features, while it imparts to each case a particular interest, also renders the deduction of general results from a number of them, as a basis of treatment for future ones, a matter of much uncertainty and difficulty. On the other hand, the study of a number of cases, guided by the peculiar features and the accumulation thus of a store of individual points, is to make the best use of the material at command. Every addition to this store is worthy of consideration.

The following cases, with the exception of the last, which occurred in private practice, were treated in St. Vincent's Hospital, New York, during the writer's residence as House Surgeon. The report is made from notes taken at the time by Drs. W. H. Owens and J. F. Luby. The first fourteen were admitted during the service of Dr. Charles Phelps, and the succeeding five during that of Professor J. L. Little, as Attending Surgeons, through whose courtesy they are published:

CASE 1. COMPOUND FRACTURE OF VAULT OF SKULL, AND INCISED WOUNDS OF SCALP; OPERATION; RECOVERY. T. M., iceman, æt. 28, was admitted April 7, 1880, having been struck several times on the head with an ice axe. He was weak from hæmorrhage, but presented no evidence of intracranial lesion. There were three large incised wounds of the scalp. In one, two and one-half inches above the right ear, a raised edge of bone was discovered. This was movable, and was found to be a chip of the external table, one inch by one-half inch. Treatment: The fragment was removed and the bottom of the fissure sought by means of trephine and gouge. It was found not to penetrate the entire thickness of the skull. This wound was dressed with carbolized oil, and the others closed with sutures. An ice-bag was applied continuously for twenty-three days, in connection with the use of bromide of potassium, light diet, and laxatives when necessary. May 22, forty-five days after injury, he was discharged, cured.

CASE 2. EXTENSIVE FRACTURE OF VAULT, AND PROBABLE FRACTURE OF BASE OF SKULL; OPERATION; RECOVERY; SEQUELÆ. A. M., boy, æt. 5, was admitted April 7, 1880, his mother, while carrying him, having fallen down stairs. He was in a state of coma, and suffering from shock. There was a large scalp tumor on right side of the head, the right pupil was dilated and fixed, while the left was contracted, and there was hæmorrhage from the right ear. Patient breathed without stertor. Treatment: Exploratory incision in scalp tumor revealed a fissure having its edges depressed, extending from near the vertex, downward into right temporal fossa, where it could not be followed. The rongeur was used to cut away the depressed edges. In this, as in a majority of cases, the use of the trephine was unnecessary, the removal of an edge of bone and subsequent application of the elevator accomplishing the result sought. The dura mater was exposed for a space of two and one-half by three-quarter inches, and proved to be uninjured. The edges of the bone were carefully smoothed, the wound dressed with carbolized gauze and carbolic acid, and an ice-bag applied. Stimulants were administered hypodermically, and later by the mouth, ʒ j every hour. The patient gradually rallied. For several weeks the right pupil continued dilated, and marked right hemiplegia—same side as injury was present. The administration of stimulants, iron and quinine was necessary, bromide of potassium and the ice-bag being used to control cerebral activity. The wound granulated and healed without difficulty. There was present at any time only moderate fever. Discharged August 28. Cured. Sequelæ: Shortly prior to discharge, the patient was noticed to have difficulty in expressing his thoughts, which was attributed to his youth. One month after leaving the hospital he had become remarkedly weaker in intellect, the right pupil remained slightly dilated, and the hemiplegia had disappeared.

CASE 3. FRACTURE OF VAULT AND BASE OF SKULL; OPERATION; DEATH; AUTOPSY. A. C., male, æt. 27, was admitted April 10, 1880, having fallen thirty feet, striking his head upon a ship's deck. He was in a state of profound coma, having stertor, dilatation of right pupil, hæmorrhage from right ear and both nostrils, ecchymosis surrounding both eyes, and a large scalp tumor upon right side. He had had a marked convulsion prior to admission. Treatment: An exploratory incision revealed a fracture of frontal bone surrounding depressed fragments. The fissure extended into temporal fossa. The trephine and rongeur were used to remove the depressed bone and rough edges for about two inches of the length of the fissure. The dura mater was found distended, and was punctured, when a large quantity of blood escaped. There appeared no injury to the brain. The wound was dressed with carbolized oil. After the operation there was considerable twitching of both sides of body, especially the right, but no marked convulsion. Without recovering consciousness, on the following day the patient died. Autopsy showed a fissure extending from right frontal eminence into temporal fossa, and thence into the base. Both orbital plates and right middle fossa of the base were fractured. A large surface clot covered the right side of the brain.

CASE 4. CONTUSED WOUND OF FOREHEAD; MENINGITIS; DEATH; AUTOPSY. C. M., boy, æt. 6, was admitted May 8, 1880, one week previously having been kicked in the forehead by a horse. He had suffered from headache, and for two or three days before admission had been lethargic. On admission he was semi-comatose, with very feeble pulse, rigidity of muscles of neck and back, contracted pupils, and marked fever. On the left side of the forehead was a small contused wound, nearly healed, covering a circumscribed induration of periosteum. Treatment: Stimulants and ice-bag to head. Twenty-four hours after admission, patient died. Autopsy showed well-marked subacute meningitis, extending from immediately beneath point of injury as a centre.

CASE 5. FRACTURE OF BASE AND VAULT OF SKULL, INFERIOR MAXILLA AND BOTH RADII; MENINGITIS SUPERVENING AFTER AN INTERVAL OF THREE WEEKS; DEATH; AUTOPSY. H. B., errand boy, æt. 14, was admitted May 13, 1880, having fallen fifteen feet to the floor, striking upon his face and outstretched hands. He was suffering from shock, and lay motionless, without stertor, unless disturbed, when he manifested hyperæsthesia and active delirium. The left side of the face was contused, and ecchymosis surrounded both eyes. He had slight hæmorrhage from both nostrils, none from ears, and no subconjunctival hæmorrhage. There was no paralysis, but the delirium gradually became constant and violent, requiring restraint. A careful examination revealed no local evidence of fracture of the vault. Both radii were fractured three-quarters of an inch from the distal extremities, with the characteristic silver-fork deformity. The inferior maxilla was fractured between the first and second left incisors. A fracture of the base was suspected from the above symptoms. Treatment: Bromide of potassium, ice-bag to head, cold applications to face, four-tailed bandage for fractured jaw, and splints, not including the wrist joints, for fractured radii. Within twenty-four hours the delirium disappeared. The patient was now rational, and had only slight headache. This disappeared on the succeeding day, and he was then entirely free from any symptoms of cerebral lesion, so that the diagnosis of the fracture of the base was now abandoned. On the third day after admission a small swelling, like a bruise, was observed at the upper edge of the left side of the forehead. An opening was made, and a careful search with the probe revealed nothing. The patient was now allowed to get up. His pulse, respiration and temperature were normal, his appetite good, his sleep natural, and the special senses undisturbed. About two weeks after admission, a small, hard point, like a fine shot under the skin, was discovered adherent to the bone over the right eye. It was painless, and supposed to be old. The patient continued to enjoy good general health and entire absence of cerebral symptoms until June 5, twenty-three days after the injury. At this time, without ascertainable cause, he had headache, followed by chill, nausea, vomiting and delirium. P. 92, R. 42, T. 102⅜°. Diagnosis, acute meningitis. Treatment: Ice-bag, bromide of potassium in full doses and leeches behind ear. On the following day the above symptoms, especially the delirium, had markedly increased. The pupils became contracted, opisthotonos supervened. P. 120, R. 34, T. 105⅛°. On the next, the twenty-sixth after the injury, symptoms of compression occurred, and the patient died. Autopsy revealed extensive fracture of base and vault of skull. From the juncture of the saggittal and coronal sutures a fissure could be traced forward, in the median line to the base of the skull, thence through the cribriform plate of the ethmoid, to the left of the crista galli, and through the body of the sphenoid. About one and one-half inches above the root of the nose, a branch fissure was given off, which passed obliquely downward and to the left, to the outer side of the orbit, and thence through the orbital plate. This fracture was not discovered by the probe during life, because the opening had been made nearer the median line. The nodule noticed was found to be an exostosis upon the edge of this fissure, just above the frontal sinus. Both orbital plates were fractured in many directions. Little or no effort at union appeared. The membranes were found engorged, thickened, and covered with flakes of purulent lymph. The meningitis had been general, and had apparently originated in the left anterior fossa of the base.

CASE 6. FRACTURE OF BASE OF SKULL; LARGE SURFACE CLOT; DEATH; AUTOPSY. G. R., butcher, æt. 40, was admitted June 4, 1880, having fallen a distance of thirty feet to the sidewalk. He was semi-comatose and delirious, with a rapid and feeble pulse, and slight stertor. The left side of the face was much contused, and over the left eye was a contused wound. Patient soon became profoundly comatose, with all the symptoms of cerebral compression, and died in three-quarters of an hour after admission. Autopsy disclosed fracture of left orbital plate, and large surface clot within the dura mater, on the right side.

Case 7. Depressed fracture of vault; operation; death; autopsy. L. Z., female, æt. 17 months, was admitted June 6, 1880, having fallen about thirty feet to the ground. She was in a state of coma, approaching collapse, with dilatation of both pupils and stertor. A large scalp tumor occupied the left side of the head. Treatment: An exploratory incision was made, which revealed a depressed fracture, extending from the anterior fontanelle forward to the left frontal eminence, and backward along the saggittal suture to the posterior fontanelle. The edges of the frontal portion were much depressed. These were removed with the rongeur. Stimulants were administered. Patient subsequently showed less marked symptoms of compression, but did not rally, and in seven hours after admission died. Autopsy showed fracture, as above, and extending backward into occipital bone. The brain showed no lesion, and death had apparently been caused by shock.

Case 8. Compound fracture of vault of skull and laceration of eyeball; recovery. D. G., housekeeper, æt. 40, was admitted June 14, 1880, having been struck in the face with a heavy iron vessel. Her general condition was good, and there was no evidence of injury to the contents of the skull. The left eyeball was lacerated, causing a total loss of function. A contused wound over this eye communicated with an undepressed fracture into frontal sinus, and upward in the frontal bone. Treatment: Cold water dressing and rest in bed. July 17, thirty-three days after the injury, the wound had entirely closed, and the patient was discharged.

Case 9. Concussion of brain and fracture of inferior maxilla; continued cerebral symptoms; recovery. M. P., expressman, æt. 30, was admitted June 17, 1880, having been kicked in the face by a horse. He was unconscious, but could be aroused. The pulse was feeble, pupils even and responding to light, the right being more sensitive. The right side of the face was much contused, and the inferior maxilla fractured upon the right side near the angle. Treatment: Quiet. On the following day, ice-bag and bromide of potassium. Patient did not recover his mental faculties, but continued in a state of semi-consciousness, with occasional low delirium, resembling the typhoid state. Constipation was marked, and difficult to overcome. It was finally suspected that the use of the ice-bag and bromide contributed to this condition of affairs. On July 9 these were suspended, with good effect. The delirium diminished, the patient gradually became rational, and on July 18, thirty days after the injury, was discharged, cured.

CASE 10. COMPOUND FRACTURE OF VAULT OF SKULL; STRUMOUS CACHEXIA; RECOVERY. J. R., shoemaker, æt. 52, was admitted June 18, 1880, having been struck on the head with a heavy drinking glass. He had angular curvature of the spine, with strumous cachexia, and very feeble constitution. Upon the face and scalp were a number of contused wounds, one, over left eye, leading to an irregular, undepressed fracture of frontal bone, extending up to the frontal eminence. There were no symptoms of intracranial lesion. Treatment: Ice-bag, bromide of potassium and rest. Later, in consequence of the general bad condition, the administration of iron, quinia, and large amount of stimulants was found necessary. August 25 he was discharged, cured.

CASE 11. COMPOUND DEPRESSED FRACTURE OF VAULT OF SKULL WITH LACERATION OF MEMBRANES AND BRAIN; OPERATION; HERNIA CEREBRI; DEATH; AUTOPSY. J. J., school-boy, æt. 10, was admitted June 18, 1880, having received a heavy blow with a cart-rung. Although suffering somewhat from concussion, he was able to talk intelligently and had no symptoms of compression of the brain. Above and exterior to the left frontal eminence was a contused wound communicating with a depressed fracture of the skull. The patient was irritable and even violent when the wound was approached. Treatment: It was necessary to administer ether, as the patient was otherwise uncontrollable. The fracture was found to be saucer-shaped, one inch in diameter, having its centre depressed about one-fourth of an inch. The sharp edge of a fragment had pierced the membranes and penetrated into the brain, making a wound one-half inch long. The fragments were removed and the rough edges cut away with the rongeur. Carbolized cold water dressing and an ice-bag were applied, and bromide of potassium (gr. v, ev. 2 hrs., varied p. r. n.) administered. P. 120,

R. 32, T. 104°. In a few days the brain began to protrude through the opening in the membranes. The protruded mass gradually increased in size, sloughed, and was accompanied by high fever. Light compresses were applied with a view of controlling the hernia, but their application was followed by convulsions and the attempt was abandoned. Two weeks after the injury, the mass had reached the size of a hen's egg, was very fetid, and was discharging large clots of disintegrated brain tissue. Up to this time the patient had retained perfect intelligence, but was exceedingly irritable. Tonics and small quantities of stimulants were administered. The protruded mass was supposed to contain an abscess, and punctures were made into it. These were found to be perfectly painless, however deep, while the surrounding membrane was acutely sensitive. Sixteen days after admission, twitching of the face and the right upper extremity were manifested. Two days later, one or two slight convulsions, more marked on the right side, occurred. Hæmorrhage from the mass now supervened and continued until July 7, nineteen days after the injury, when the patient died. Intelligence was retained until twenty-four hours before death. Autopsy: The body was much emaciated, and all the internal organs found to be very anæmic. The membranes were adherent to the brain all over the left hemisphere. This hemisphere was almost entirely softened and disintegrated. The right hemisphere and the base appeared normal.

CASE 12. COMPOUND FRACTURE OF VAULT OF SKULL; RECOVERY. M. M., laborer, æt. 28, was admitted June 24, 1880, having been struck on left side of head and face with a heavy carving knife. The wound communicated with an undepressed fissure extending backward from just behind the left mastoid process. He had no symptoms of intra-cranial lesion. Treatment: Cold water dressing was applied, bromide of potassium administered, with a cathartic when necessary. July 30—thirty-six days after injury—he was discharged cured.

CASE 13. COMPOUND FRACTURE OF VAULT AND BASE OF SKULL WITH LACERATION OF BRAIN; DEATH; AUTOPSY. M. R., longshoreman, æt. 29, was admitted July 6, 1880. A heavy iron hook, swinging from a derrick, had torn its way through the anterior part of the skull. The patient was unconscious, and had dilatation of both pupils and a rapid and feeble pulse. He had had one convulsion before and one after admission. An irregular lacerated wound, about two inches in length, extended across the forehead and presented commingled fragments of bone and brain tissue. A triangular piece of bone an inch in diameter was deeply imbedded in the brain. There was considerable hæmorrhage from the longitudinal sinus. Treatment: The fragments of bone were removed with the fingers and forceps. Stimulants were given p. r. n. The patient did not rally, the hæmorrhage continued, considerable brain tissue came away, and on July 8, two days after the injury, the patient died. Autopsy: A little to the left of the median line of the frontal bone was an opening one by two inches. From the junction of the sagittal and coronal sutures, two fissures were found to extend; one in the median line along the edge of the above opening, thence into the base of the skull passing through the ethmoid; the second obliquely forward and to the left to the base, where it passed into the orbital plate at its outer part. The left side of the frontal bone, thus included and containing the opening, was attached to the base by only a small portion, and was elevated about one-eighth inch. At the right parietal eminence was a depressed fracture, the inner table being much splintered. The membranes and brain at the site of each fracture were extensively lacerated.

CASE 14. FRACTURE OF VAULT AND BASE OF SKULL AND INFERIOR MAXILLA; OPERATION; HERNIA CEREBRI; DEATH; AUTOPSY. W. S., driver, æt. 17, was admitted July 28, 1880. He had fallen thirty feet, striking his head upon a board floor. He was semi-conscious, and manifested active delirium when disturbed. Ecchymosis surrounding both eyes was so extensive that the pupils could not be seen. He had no stertor nor paralysis. The pulse was rapid and very feeble. Over left frontal eminence was a large scalp tumor. There was a profuse hæmorrhage from both nostrils and free escape of cerebrospinal fluid from the left ear. The inferior maxilla was fractured between the first and second left incisors, and the right middle metacarpal bone was fractured. Treatment: Stimulants were administered hypodermically and by the mouth. On the following day the patient had rallied considerably. Ether was administered because of the excessive irritability, and an exploratory incision made into the scalp tumor. A comminuted, depressed fracture was found and several large fragments of bone removed. The rough edges were cut away with the rongeur, the use of the trephine being found unnecessary. The dura mater was found to be contused and distended. It was pierced but no blood escaped at the time. The wound was dressed with lint and carbolic acid, and an icebag was applied. Stimulants were ordered p. r. n., and bromide of potassium in full doses. The condition of the patient—semiconscious, except when disturbed, then violently delirious—continued, with the addition of high fever; on the third day the temperature rising to 108°. The cerebro-spinal fluid continued to escape freely from the ear, and some oozing of dark blood with slight protrusion of brain occurred from the wound. On August 1, the fourth day after the injury, he died. Autopsy: A fissure was found extending from the opening at left frontal eminence across the median line to right supra-orbital foramen. A second was traced from left supra-orbital foramen backward across anterior and middle fossæ, and through the petrous portion of the temporal bone. The body of the sphenoid, and the cribriform plate of the ethmoid were fractured, and both orbital plates comminuted. The membranes were adherent and thickened, and showed inflammatory changes. These were more marked near the opening, at which place the brain was disintegrated.

CASE 15. SURFACE-CLOT AND URÆMIA; DEATH; AUTOPSY. M. P., housekeeper, æt. 48, was admitted August 9, 1880. About twenty-four hours previous, while supposed to be intoxicated, she had fallen and struck her head against a door. She had been unconscious since that time. No history of convulsions could be obtained. On admission the patient was in a state of profound coma. She had dilatation and immobility of right pupil, and a feeble pulse of 112. Over the left side of forehead was a large scalp tumor, and over right a contused wound. There were present œdema of extremities and albuminuria. Exploration of scalp tumor and wound revealed no fracture. Treatment: Mustard was applied over the kidneys, and elaterium and jaborandi administered. In eighteen hours after admission, patient died. Autopsy: A large clot was found on right side between dura mater and skull. There were signs of an old meningitis. The abdomen was not examined.

CASE 16. FRACTURE OF VAULT AND BASE OF SKULL; SURFACE CLOT; DEATH; AUTOPSY. G. M., boy, æt. 4, was admitted August 26, 1880, having fallen about fifteen feet to the flagging, striking upon his head, He was in a state of profound coma, with cold extremities and feeble pulse. There were present dilatation and immobility of the left pupil, hæmorrhage from the left ear, and sero-sanguinolent discharge from the right. Ecchymosis surrounded the right eye. A large scalp tumor, through which a fracture could be felt, occupied the left side of the head. Treatment: Warm applications to extremities. Patient died in two hours after admission. Autopsy: A fissure about six inches in length was found extending from the left temporal fossa backwards and inwards to a point three inches above occipital protuberance. The middle fossa of the base on the right side was fractured. A large surface clot was found within the arachnoid upon the left side.

CASE 17. FRACTURE OF VAULT AND BASE OF SKULL; SURFACE CLOT; DEATH; AUTOPSY. C. C., laborer, æt. 40, was admitted September 16, 1880. No history of the manner of his injury was obtainable. He was in a state of coma, had a slow, full pulse, and stertorous respiration. The left pupil was contracted, the right dilated. He had marked twitching of right side of the body. Over left eye and behind right ear were contused wounds, while the left eye was ecchymosed. Treatment: Ice-bag was applied, and perfect quiet maintained. Carbolized dressings were applied to the wounds. On the following day the patient manifested evidences of returning consciousness, but died on the second day after admission. Autopsy: A fracture was found extending from one and one-half inches above right mastoid process downward and backward nearly to the foramen magnum; also a second through right greater wing of the sphenoid. A surface clot within the arachnoid was found upon the anterior portion of each hemisphere, that upon the right being the larger.

CASE 18. FRACTURE OF BASE OF SKULL; SURFACE CLOT; DEATH; AUTOPSY. E. S., housekeeper, æt. 40, was admitted September 18, 1880, having fallen forty feet upon her head. She was unconscious, the pulse was slow and feeble, both pupils were dilated and fixed, and there were present slight stertor and hæmorrhage from the mouth. External to the right frontal eminence was a large scalp tumor. There was no hæmorrhage from the ear. Patient died in twenty minutes after admission. Autopsy: A fracture was found on the right side of the base, extending from the middle fossa through the petrous portion of the temporal bone into posterior fossa; also a short fissure into the foramen magnum, and one through sella turcica. A large clot within the arachnoid occupied the right side.

CASE 19. FRACTURE OF VAULT OF SKULL, AND LACERATION OF BASE OF BRAIN; SURFACE CLOT; DEATH; AUTOPSY. P. O., laborer, æt. 40, was admitted September 20, 1880. A brick had fallen upon his head from a height of forty feet. He was conscious, but slightly incoherent and irritable. He then had severe headache, but no other evidence of intra-cranial lesion. To the right of the vertex was a contused wound communicating with an undepressed fissure. Shortly after admission patient became violently delirious, requiring restraint. Treatment: Sulphate of morphia gr. ⅙, hypodermically. The wound was dressed with borated cotton and carbolic acid, an ice-bag applied, and bromide of potassium administered. The patient soon became more quiet. The left pupil was observed to become markedly dilated, the right remaining normal. A few hours later the left had become contracted. Four or five hours after admission the patient had become lethargic, but was violent upon being disturbed. On the following day well marked symptoms of cerebral compression, stertor, slow and full pulse, coma and dilatation of the left pupil supervened. On the second day after the injury these symptoms continued, the temperature rose to 105⅖°, and the patient died. Autopsy: The fissure extended from the vertex downward, forward and to the right, to the centre of middle fossa on the right side of the base. At this point the base of the brain was slightly lacerated, and presented evidence of local inflammation. A clot of blood, six by four inches, external to the dura mater, had caused marked flattening of the convex surface of the left side of the brain.

CASE 20. COMPOUND FRACTURE OF VAULT; RECOVERY; SEQUELÆ. J. R., glassworker, æt. 14, was first seen November 5, 1880. Three days previous he had received a blow on the head from a brick. He became immediately unconscious, but in a short time was able to walk to his home. On the second day after the injury he had severe headache and symptoms of constitutional disturbance. On the following day, when first seen, he had had two well marked convulsions. When six years old the patient had fallen upon the back of his head. This was succeeded by occasional convulsions for six months, since which time he has had none up to the present. Upon examination, he was found to have severe pain in the head at the point of injury, hebetude and intolerance of light and sound. The pupils were slightly contracted, equal and responded to light. The pulse was 112, temperature 102⅜°. The bowels were constipated. A contused wound of the scalp was found just anterior and internal to the right parietal eminence, at the bottom of which was the juncture of three fissures of the skull. One extended downward and forward, one downward and backward, and the third inward and slightly forward. The periosteum had been removed for a small space. Treatment: The wound having been enlarged, a difference of level of half the thickness of the bone was found between the edges of the fissures. Elevation was urged, but under advice was not attempted. The wound was dressed with cold water, and an ice-bag applied. Perfect quiet in darkened room, with liquid, unstimulating diet, bromide of potassium, gr. x, every two hours, and a saline cathartic were ordered. The convulsions did not recur; two days later the temperature and pulse became normal, and only occasional slight headache occurred. The bromide, in gradually reduced amount, and the ice-bag were continued for nearly six weeks. The patient was then allowed to get up. On December 22, nearly seven weeks after the injury, a piece of dead bone three-quarters by one-eighth of an inch was removed, and the wound healed without difficulty. Sequelæ: About two months later patient began to experience severe general headache, and became very susceptible to noise, and irritable. He was anæmic. Treatment: Syrup of the iodide of iron, gtt. xv, three times a day, and avoidance of exciting causes. A month later the symptoms had not perceptibly abated.

Some points of interest may be found in each of the foregoing cases. It is evident that these are, individually, of more practical importance than any deductions and inferences to be drawn from tabulating them as a whole. This would be equally true were the series many times as large. It would appear that the difference in plans of treatment advised by high authorities has had its origin in the ignoring of this very fact, and in deciding, in general, questions which can only be properly settled upon the merits of each particular case.

There is one measure, frequently neglected, which cannot be too strongly urged—namely, that all suspicious tumors of the scalp be incised, and the underlying skull carefully explored for a fracture. Should none exist, that fact is important. Should one be found, the proper treatment and probable result may then be intelligently considered. The addition of a clean scalp wound is a trifling consideration. The question of operation upon the skull frequently presents itself as a problem difficult of solution. The history of the case, the condition of the skull externally and the symptoms which denote its condition internally, may be considered the three factors which are distinct in each case, while the following well-known truths may represent the constant quantities in the solution of this problem:

1. Injuries to the head are serious not in proportion to the amount of damage suffered by the skull, but more nearly to that experienced by its contents.

2. The injury to the intra-cranial tissues may be produced by the same force, at the same time as that of the skull, as rupture of a vessel by the same force that causes a fracture.

3. The injury may be a consequence of that of the bone, as, primarily, laceration or compression of the membranes and brain by a fragment of bone; secondarily, by the intervention of inflammatory processes, as meningitis caused by an irritation from abnormal conditions of bone.

4. It may be partly concomitant with that of the bone,

and partly caused by it, with or without the intervention of inflammatory action.

5. It may occur without any injury to the skull, as intra-cranial hæmorrhage or meningitis following a blow upon the head.

It is evident that any general plan of treatment must be based upon these constant factors alone, and therefore cannot be applied indiscriminately. But these factors furnish, however, some important conclusions. From the first of them follows, as a necessary consequence, an important consideration as to the gravity of operations upon the head.

For, as force is only dangerous in proportion as it is expended upon the contents of the skull, the careful removal of bone without infliction of injury upon these contents cannot be a very hazardous proceeding.

From the third and fourth it is equally evident that, since the abnormal condition of the bone is so great a factor in determining intra-cranial, and therefore dangerous lesions, the importance of its removal can hardly be over estimated. As an irritant, its action may be delayed, but the natural forces cannot remove it. The best they can do is to round it off and render it as innocent as may be, and this is only accomplished by the very process so important to avoid—that of inflammation. With reference to waiting, in hope that subsequent events may prove operative measures unnecessary, there is this to be considered: That should any abnormal conditions threatening the contents of the skull exist, not only is the case compromised by a prolonged subjection to the injury, but that any operative measure in proximity to inflamed meninges is quite different in its tendency from the same measure near parts in a healthy state. The possibility, further, of a recovery without operation, and subsequent difficulty from injured bone, as illustrated in cases 5 and 20, should not be ignored.

The question of resection of the skull, with or without the trephine, may, then, be called into consideration on account of the conditions of the bone itself, as above, or to relieve symptoms not caused by the bone, as to furnish an exit for blood or inflammatory products. Although too much emphasis cannot be laid upon the importance of avoiding generalities, and upon deciding each step upon the merits of the particular case under treatment, the conclusion seems a fair one that true conservatism is not that which waits to see what nature can do when hard pressed, but that which disregards the skull when its contents are to be considered, and which, when possible, removes a cause of harm before it has had time to effect any damage.

A proportion of cases where the propriety of operation is *sub judice* are those presenting a combination of injuries, as, for example, a fracture of vault and probable fracture of base. Where respect for record as an operator enters, that frequently decides the matter. But leaving this aside—as may be easily done in theory—it often becomes a choice of subtracting, or not, from the sum total of the patient's disabilities those possible to be removed. It would appear as though the fact of a case being considered "hopeless" would simplify the matter. For surely a hopeless case cannot be injured.

The only post-mortem results which indicate an operation upon the skull to have been improper, are those which show it to have been an active element in causing death which would not have been caused by the conditions calling for the operation. These results are rarely found.

# A CASE OF TUBULAR SLOUGH OF THE URETHRA, INVOLVING THE MUCOUS AND SUBMUCOUS TISSUES.

By WILLIAM M. MASTIN, M.D.,

OF MOBILE, ALA.

THROUGH the courtesy of Dr. Sherard, of this city, I am enabled to present the following sketch of an exceedingly interesting case. The patient was under the professional care of Dr. S., and was not seen by me until after the subsidence of the more acute symptoms, at which time an urethral exploration was made, and the present detailed history elicited.

CASE. T. Kleinjohann; German; æt. 44 years; blonde, robust and healthy; carpenter by trade; married, and the father of several children. He is moderately dissipated—indulging in periodical sprees—but with this exception leads a passably regular life. In 1863, after impure connection, an ulcer appeared on the glans penis. This was small, single, painless, and healed without trouble after some stimulating application. There were no sequelæ of any description, nor has he since discovered, at any time, the least evidence of syphilitic taint. Examination now shows a healthy glandular system, and an entire absence of all physical indications of a constitutional vice. About January 1, of this year, he had suspicious sexual congress. Although haunted with the fear of venereal infection, causing him to make frequent examination of the genitals, no trouble resulted until the 14th of the month, when he was attacked by repeated sensations of chilliness and heat, muscular pains, with general malaise, soon followed by vesical uneasiness and urethral irritation. Inspection revealed a slight bloody discharge from the urethra, containing numerous blackish "specks and threads," some redness of the meatus, but only slight pain on micturition. Urine high-colored and scanty. Two days later (January 16) he procured equal quantities of zinc sulphate and lead acetate, which, added to a pint of water (inquiry showed that the solution was a saturated one, since the quantity of salts was too great to dissolve in the water employed), he used from four to five times daily, as an injection. This application was excessively painful, and greatly increased the already existing vesical and urethral irritation. January 17. Slight chill, followed by fever. The discharge with pain in urethra and bladder continue. January 18. The sanious discharge ceased, but the injection was continued for a day longer—making three full days' use of the solution. Micturition still painful; urethra irritated; constitutional symptoms still only slight. January 19. In afternoon of this day the stream of urine became much reduced in size, and occasionally passed only *guttatim*, and, as he expressed it, the canal "seemed to be closing up." January 20; *morning*. Retention of urine complete. Great pain and vesical tenesmus. Dr. S. summoned, who, upon examining the parts, found the meatus filled with a grayish substance, which completely occluded the outlet. Gentle traction with the dressing forceps removed a tubular cast of from two to two and a quarter inches in length, and, apparently, about the ordinary diameter of the urethra (vide A, Fig. 1). This was soft, easily torn, and bore every evidence of coming from a granulating surface. With the removal of this a few drops of blood escaped, and the urine flowed with tolerable freedom. No instrument introduced into urethra. A little increase in temperature. Quinine ordered internally, and a weak solution of carbolic acid as an injection. *Afternoon.* Urethra explored with a bulbous bougie (about 12 English). The navicular fossa was smooth, soft, and natural, but immediately behind it the urethra became rough, irregular, and sensitive—the roughness continuing as far back as the membranous portion, when the canal again became smooth. Pain was experienced during and some blood followed this examination. Later in the evening retention again came on, which continued until midnight, when the tenesmus, being unbearable, he strained excessively, and forced the water out, which came with a gush, carrying before it another piece of the urethral exfoliation about three and a quarter inches long (vide B, Fig. 1). This afforded prompt relief. January 21. Urethra again somewhat obstructed, but in a few hours the flow re-established itself. Micturition very painful, but no blood or shreds in urine. No discharge. Citrate potash and flax-seed infusion as diluents were ordered. Quinine continued. January 25. Chill and fever; local trouble better. February 3. Since chill on 25th ult., he has been getting on nicely; general condition now good; no discharge; and, with the exception of painful erections and some pain during urination, he considers himself well. On examination I now find circumference of penis three and six-eighth inches, with a contracted meatus. He refuses to submit to an instrumental exploration. No visible signs of inflammation, or of there being anything wrong whatever. Resumed work several days ago.

I have thus given an extended history of this case, since, as far as my knowledge goes, it is unique in the records of urethral literature; and, furthermore, this, with the other points which it offers for consideration, is of sufficient interest to merit a few remarks concerning it. The interesting features in this connection are briefly as follows:

1. The extreme rarity of such an urethral lesion.

After a careful and somewhat extended research among the productions of the chief writers upon genito-urinary subjects, and an examination of a large number of the principal medical and surgical periodicals for a space of some years back, I have failed to find the slightest allusion to such a condition as is presented by this case. Even in the chapters of special treatises, devoted to injections and their abuses—dwelling in particular upon the disastrous effects of strong, stimulating injections, as formerly employed in the urethral medication of blennorrhagia—and to urethral cauterizations, no reference is made to the possibility of the action of these agents extending to such a degree as to produce sloughing of any portion of the canal. Some authors, it is true, speak of shreds of tissue passing from the urethra as a result of the employment of the so-called abortive treatment of gonorrhœa, and this I have seen myself, but it is not a proper slough—only a limited exfoliation of the epithelial layer of the urethral mucosa, entangled with strings of coagulated mucus.

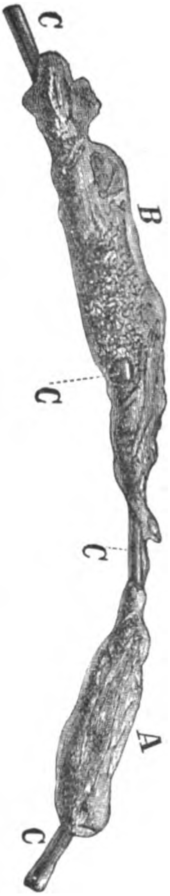


FIG. 1. SLOUGH OF THE URETHRA. *From Photograph.*

The exfoliations, ⅛ full size, threaded over a filiform guide. A, first slough, 2¼ inch long; B, second slough, 3¼ inch long; CCCC, filiform guide.

In the present instance, however, the *entire* thickness of the mucous membrane—mucous and submucous layers—was evidently involved, as is shown in the annexed wood-cut (Fig. 1).

The only mention of a case having any semblance of relation to this point—although it was the result of an injury, and therefore not analogous—is the one spoken of by Bryant (Practice of Surgery, p. 550; Phila., 1873) as occurring in the service of Mr. Hilton, at Guy's Hospital, London, and of which Fig. 2 represents the appearance of the virile organ on the patient's admission to the house.

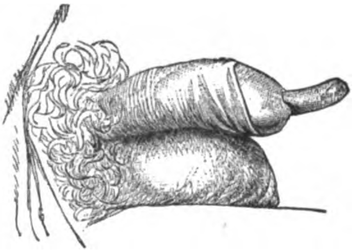


FIG. 2. CORPUS SPONGIOSUM PROJECTING FROM URETHRA AFTER INJURY.

*(After Bryant.)*

This patient was a man aged 50 years, who, when a youth of 19, had his penis injured by the bite of a stallion. The fleshy protrusion from the urethral orifice, as depicted in the drawing, was diagnosed to be the corpus spongiosum urethræ, which had been thus divided, everted, and was then firmly attached in this position. Examination demonstrated the spongy body of the urethra as terminating abruptly about one inch behind the glans—the urine flowing along the side of the protrusion during micturition.

2. Was the slough the result of the injection used, or did it originate from another cause?

That the injection was the direct producer I have not the slightest doubt. The history and entire progress of the case points alone to it. Here was a man in the enjoyment of excellent health; he indulges in suspicious sexual intercourse, and has great apprehensions as to results therefrom; in due time urethral irritation and a discharge appear; he uses, evidently, a caustic application, and within a period of four or five days the canal is filled with a slough. Again, there was but little constitutional involvement, for the malaise and general indisposition which preceded the local trouble, was, doubtless, of mental origin, proceeding from the fear of venereal infection. The subsequent febrile rise was trivial, and scarcely sufficient to confine him to his bed. Some might here ask, if this exfoliation did not partake of the nature of a pseudo-membrane? Even had it been proven that diphtheria does occasionally manifest itself locally within the urethra, or that a non-specific croupous deposit can take place in this tube, the absence of *marked* systemic reaction would debar causes of such a character in this instance. But as the occurrence of diphtheritic or croupous exudates in this locality is far from being demonstrated, I refer to such a lesion simply to exclude it. Then the query arises—

3. Could the combination of the sulphate of zinc and acetate of lead, or either separately, have produced this escharotic effect?

I regard this as most questionable. The union of these two salts produces a double decomposition, resulting in the formation of the sulphate of lead and the acetate of zinc—the former an insoluble, unirritating substance, and the latter scarcely possessing escharotic properties, and, indeed, one of the mildest metallic astringents of the materia medica. Furthermore, had they been used separately, the acetate of lead is very similar in its action to the acetate of zinc, and even had the sulphate of zinc—the most decidedly corrosive of the ingredients mentioned—been alone employed, I am doubtful whether it could have produced an eschar of this depth and extent. Sulphate of zinc has no action on the healthy cutaneous surface, and to produce a deep slough of a mucous membrane would necessitate, probably, its continued application in powdered form. Hence, I am inclined to believe that the patient confounded the names of the zinc salts, having procured, in all likelihood, chloride for sulphate of zinc, or there may have been a mistake on the part of the druggist, and thus the one dispensed for the other. This, unfortunately, could not be determined, as none of the solution was to be procured, and so this is simply a matter of conjecture.

4. The extent and character of the urethral contraction which will result from this lesion.

From *a priori* reasoning I would predict a dense and firm contraction to the full extent of the primary morbid action—that is, the whole length of the slough, from the membranous portion to the fossa.

I shall endeavor to keep the patient under observation; and, at some future period, will take pleasure in recording the condition then presented by his urethra.

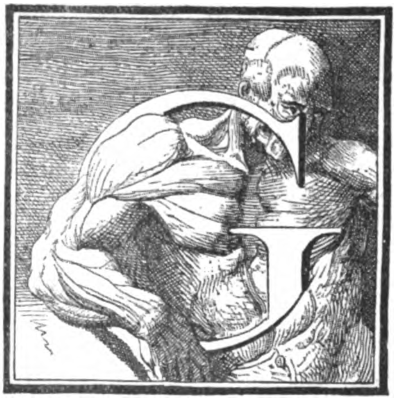
# HISTORICAL AND BIBLIOGRAPHICAL NOTES.

## A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

## XV.—CLAUDIUS GALENUS (Concluded).

A. D. 130—200.



GALEN'S surgical writings have not been as highly esteemed as those of Hippocrates, Celsus, and some others. He practiced surgery in his native city of Pergamus, but when he resided in Rome he appears to have followed the custom of the physicians of that city, and to have abstained from surgical practice. He, however, wrote commentaries on the surgery of Hippocrates—on fractures, dislocations, bandaging, etc. He suggested improved methods in the treatment of injuries of the nerves. He applied the trephine successfully to the sternum for evacuating the contents of an abscess behind that bone. On four occasions he treated anterior luxations of the femur; twice he cured what was supposed to be spontaneous luxation of that bone. He op-

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posed the use of caustics and the cautery, which were employed so freely and were so much abused in ancient times. Galen was a copious blood-letter, a practice which he perhaps carried to excess, as he admits having taken no less than fifty ounces from one patient in a single day. Besides venesection and arteriotomy he employed cupping, but did not approve of the use of leeches; which, by the way, were first introduced into practice by Themison, and freely used by the Methodic sect.

In a neat little article of about half a dozen pages by Dr. Thos. K. Chambers, "The Blood-letting Question in Olden Times" (*Brit. and For. Med. Chir. Rev.*, vol. xxii. p. 475, 1858) is discussed, and some very interesting extracts from the works of Galen relating to this subject therein given. From this article I will furnish the reader with the following discourse of Galen, which illustrates not only his easy and familiar style, but also the opposition of the Romans to blood-letting, which was founded solely on the authority of Erasistratus, who had then been dead more than four hundred years.

Dr. Chambers says: "Let us, then, fancy ourselves in the metropolis of the world, prosperous and glorious under the rule of the Antonines, in the latter half of the second century, and let us hear Claudius Galen lecture the public in his pleasant chatty style 'Against certain Erasistrateans.' (*Kühn's Galen*, vol. xi, p. 187.)

"When I first came to Rome[1] I found some physicians who were so averse to venesection that sometimes when a man was scarce able to breathe from congestion they would not employ this treatment. There was a woman, just under twenty-one, who, after suppression of the catemenia, had a flushed face, with loose cough and dyspnœa, whom they treated by bandaging the limbs and depriving her entirely of food; but they would neither open a vein nor let me do so. And on account of their being acquaintances of the woman's household and senior practitioners, more faith was had in their opinion than in mine. I made no more attempts to persuade them to bleed, but I asked if there was any objection to set up a derivation of blood towards the uterus by means of drugs calculated for that object. And when they consented I immediately got the midwife usually employed by the patient and desired her to use them. But she said she had already applied remedies of this sort at the proper time—namely, when the catemenia might normally be expected; and she named the drugs—all of tried efficacy—which she had administered to the woman, so that no one could suppose that it was from the inefficiency of these medicines that relief had failed to be given. When I heard this, and moreover that the menses had been already suppressed four months, I had another consultation with the medical men to try and persuade them to bleed. When they refused, I wondered why, if they were anxious to evacuate the superfluous blood through the uterus by opening the mouths of the numerous veins there, yet they should think the evacuation injurious when it was made by opening any other vein. They stated that superfluous blood could be evacuated by fasting alone, without having recourse to treatment such as I proposed. So I held my tongue and took my leave in despair about the woman on account of the cough and dyspnœa. I expected that she would either spit blood from the chest or from the lungs by the bursting of a blood-vessel, or would have laryngitis, or pleurisy, or pneumonia; and my hope was, as a choice of evils, that she would have pleurisy, for I was afraid, in case of laryngitis and pneumonia, that the risk would be imminent, and that in case of hæmoptysis that the occurrence of it would be fatal. And such turned out to be the result. For as she was coughing very violently blood was thrown up. And now some non-professional persons complained of the doctors who opposed the bleeding, and hopes were expressed that now at least, though not before, they would be shamed into permitting the treatment. When they would not give way, but desired the bandages round the limbs to be tightened, and persisted in the attempt at derivation towards the uterus, and in continuing the starvation, I took my leave, persuaded that I could effect nothing on account of the gentlemen's age and celebrity. And very shortly afterwards the patient was seized with an incurable difficulty of breathing, and died.

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[1] Viz., in the thirty-fourth year of his age, A. D. 165.

"Under the hands of the same physicians who opposed bleeding there also died several patients with laryngitis. And there was another patient, too, who through the whole Winter had been living high and taking no exercise, and in the Spring was as red in the eyes and face as a man kept for a long time with head on the ground and his legs in the air, and he died suffocated after five days' illness.

"Next there was a fourth patient—a woman—who was ill at the same time that the catamenia were suddenly stopped, whom those enemies to bleeding brought to death's door. They kept her for three days absolutely without food, because she had a continued fever; on the fourth day they gave her the smallest possible quantity of slops; on the fifth day they ordered fasting again, and then she got violently delirious, jumped up and ran screaming about out of doors, and the attendants had great difficulty in restraining her violence. She, however, was saved by nature through a copious effusion of blood from the nostrils.

"This was a circumstance which should excite our admiration and, at the same time, teach us what a powerful influence blood-letting has in such affections, for immediately after the hæmorrhage from the nostrils the woman was freed from all her symptoms.

"Now, previously to this, I had shunned having any communication with the medical men, guessing what they would say against the use of venesection. But since it was so very clear to all that the woman's life was saved by the evacuation of the blood, I recalled to their memory the fatal cases, expressing an opinion that perhaps those, too, would have been saved if they had been bled. And I gave sundry reasons for it. But these gentlemen involved the matter in a maze of words; twisting the argument round and round and up and down, and coming to no conclusion. However, they at last ended by taking refuge in Erasistratus, stating that it was shown by him in his First Book on Loss of Blood that it was better to apply ligatures to the limbs than to bleed."

The works of Galen have never been translated into any modern language. The only English translation of any part of Galen's works of which I have any knowledge, is that by Thomas Gale under the following title: "Certaine Workes of Galens, called Methodus Medendi, with a briefe Declaration of the worthie Art of Medicine, the Office of a Chirurgion, and an Epitome of the third booke of Galen, of Naturall Faculties: all translated into English by Thomas Gale, Maister in Chirurgerie. At London. Printed by Thomas East, dwelling betweene Paules Wharfe and Baynards Castle. 1586." These embrace the third, fourth, fifth and sixth books of the *Methodus Medendi* and *De Tumoribus Præter Naturam*. Besides these, Gale translated the third "booke of Galen of the Composition of Medicines," and also "The fourth booke of the Theraperticke of Claude Galen, Prince of Phisicke." These were published by East, at London, 1579, together with "Guydo, his Questionaries of Chyrurgerie," and some other surgical works translated by Gale. They are in small quartos, printed in black-letter. I esteem my copies among my most valuable curiosities of rare old medical literature.

The work of J. Redman Coxe, "The Writings of Hippocrates and Galen, epitomized from the original Latin translations" (Phil., 1846, 8°, pp. 681), is not a translation of any portion of the works of Galen; it consists of little more than a brief analysis of the general contents of the several Galenic treatises, and yet it is a valuable work for reference.

The Greek text has been published four times—twice alone, and twice with a Latin translation. The first edition was the Aldine, published at Venice in 1525, in five folio volumes, which contain an aggregate of over three thousand pages (1514 folios of 58 lines each). It was ably edited by Jo. Bapt. Opizo, and yet it is not without numerous errors and omissions, as is almost unavoidable in so large a work. It contains the Greek text without translation, notes or indices. The writer prides himself in the possession of a fine copy of this, the *Editio Princeps*, which is not only quite rare, but is an exceedingly handsome book, and one of the choicest specimens of the splendid Greek typography for which the Aldine press, in the early part of the sixteenth century, was so famous.

The next Greek edition was published in 1538, Basil, apud Andr. Cratandum, in five volumes folio, edited by L. Camerarius, L. Fuchs and H. Gemusæus. This edition is improved by the collation of Greek MSS. and the comparison of the Latin versions. It is also a very handsome edition.

The third Greek edition is that of René Chartier, and is one undertaken and carried out on such a magnificent scale that I feel disposed to devote a few lines to an account of it. It was published in connection with the works of Hippocrates, in thirteen huge folios, double columns; one being the Greek text, the other the Latin translation. The entire works occupy over eight thousand pages (8,082). It was published at Paris, and was forty years in passing through the press. The first volume was issued in 1638, the last in 1679. This stupendous work was undertaken by Chartier, a

French physician, when he was already over sixty years of age. After having edited ten volumes, and having impoverished himself in their publication, he died in 1654. Blondel and Le Moine edited the three remaining volumes, which have the imprint of 1679. The last four volumes were published at the expense of Chartier's son-in-law. This edition is, in every respect, superior to the preceding ones, and, in some respects, to that which followed it. There has never been but one edition of Chartier's Hippocrates and Galen; the dates and title-pages have been changed to suit the booksellers. The volumes of my copy bear various dates, some of which have been pasted over others—as 1679 over 1638, etc.

The last and most convenient edition is that of C. G. Kühn, in twenty octavo volumes (in twenty-two parts), Greek and Latin, Leipzig, 1821–1833. Not only did Kühn propose to furnish the world with an improved edition of the works of Galen, but he had the enthusiasm to conceive the immense undertaking of editing complete series of editions of the extant works of all the Greek medical writers. He was already sixty-four years of age when he began this enterprise, and he succeeded in editing not only Galen's works, but also those of Hippocrates, Aretæus and Dioscorides. Dr. Wm. A. Greenhill, the very learned English scholar of ancient medical literature (Art. *Galenus*, in *Smith's Dict. of Greek and Roman Biog. and Mythol.*, vol. ii, London, 1873), after noticing the above editions of Galen, observes: "Upon the whole the writings of Galen are still in a very corrupt and unsatisfactory state, and it is universally acknowledged that a new and critical edition is much wanted."

According to Choulant (*Handb. der Bücherkunde für die aeltere Medicin*) one Latin version of all Galen's works was published in the fifteenth century, twenty (or twenty-two) in the sixteenth, and none since.

Galen's works were first published in a Latin translation by *Philipp. Pintium de Caneto*, 2 vols., folio, *Venet.*, 1490. It is in black-letter, and extremely scarce. The next Latin edition was from the press of the *Juntas*, fol., *Venet.*, 1541, which was reprinted with additions and improvements eight (or nine) times within one hundred years. The most valuable of these are said to be those of 1586, 1597, 1600, 1609 and 1625, in five volumes. Another good Latin edition was published by *Froben*, fol., in nine vols.; *Basil*, 1542, and in 1549 and 1561; the last is considered to be the best. The last Latin edition is that published by *Vinc. Valgrisius*, fol., 5 vols., *Venet.*, 1562.

The octavo edition, "Venetus Ex Officina Farrea, Anno. MDXLV," is illustrated with a large number of quaint wood engravings, exhibiting a great variety of apparatus for the reduction of fractures and dislocations, and the ancient system of bandaging. In these pictures we see the patients, the surgeons and the assistants. Some of the patients are stretched on beds, while others are hanging over doors and ladders. In one place we see the process of reducing dislocation of the shoulder-joint by the heel in the axilla; and, altogether, these engravings, made over three and one-third centuries ago, afford us a vivid impression of ancient practical surgery. The bibliography of Galen's works and the separate treatises, is too extensive to be embraced in an article of this character, and hence I refer the reader to Haller. *Bibliotheca Med. Pract.*, Eloy. *Dict. Hist. de la Med. Anc. et Mod.*, Dezeimeris, Portal and other medical bibliographers.

The following are the chief authorities which have been consulted in the preparation of this article: *J. Kidd. A cursory analysis of the works of Galen, so far as they relate to anatomy and physiology*, in *Trans. of the Provin. Med. and Surg. Assoc.*, vol. vi, 1837. *Thompson.* Arts. "Anatomy and Galen," *Encyclop. Britt.*, ninth ed. *Greenhill.* Art. "Galenus," *Smith's Dict. of Gr. and Roman Biog. and Myth.*, *Lond.*, 1873. *Watson. Med. Prof. in Ancient Times, N. Y.*, 1856. *Renouard's*, *Meryon's*, *Moir's* and other Histories of Medicine. *Coxe. The writings of Hippocrates and Galen epitomized, etc.*, 8°, *Phila.*, 1846.

# EDITORIAL DEPARTMENT.

## A REVIEW OF THE EDITORIAL ON THE CASE OF THE LATE PRESIDENT JAMES A. GARFIELD.

In the editorial remarks on the case of the late President James A. Garfield, which appeared in the November issue of the ANNALS OF ANATOMY AND SURGERY, the writer, after giving a resumé of the clinical history of the President's case, proceeds to a series of criticisms of the diagnosis and treatment, and closes by drawing inferences, lessons and conclusions from the consideration of it. Convinced, as I am, of the correctness of all that was done in the surgical treatment of this case, I desire to take exception to the views expressed in that editorial.

I will accept as correct the account of the case as there given, with a few exceptions. An account, "which it is believed will be of value for future reference," ought to consider the relative position of the assassin to the President; of this there is not one single word in the report,[1] and the importance of this omission is seen when it is advanced that there was no deflection of the ball. Then, again, it is stated that inflammation of the mouth was the cause of the bronchial catarrh, and that the extension of this to the ramifications of the bronchi of the right lung caused the broncho-pneumonia.[2] Now, it is exceptional for catarrh of the mouth to extend to the bronchi, but it is a common thing for bronchitis to complicate prolonged cases of disease accompanied with feeble vitality. On the other hand, extension of bronchitis to the ramifications of the bronchi is capillary bronchitis; the alveoli of the lungs must be involved before broncho-pneumonia takes place. In the case of the President collapse of the lung and hypostatic congestion had more to do with the ætiology of the broncho-pneumonia than any pre-existing bronchitis. With these exceptions I accept the report as correct, and will offer the following criticisms:

It is claimed that septicæmia was present early in the case and not recognized, and this claim is based upon the fluctuations of temperature, the progressive emaciation, the vomiting, and the occurrence of acne and parotid inflammation. Now the parotid swelling only appeared towards the middle of August, and the acne still later; the vomiting, besides being not common in septicæmia, was present more or less from the day of the wounding, and was probably due to nervous causes. As to the fever and emaciation they were not more than may occur in the surgical fever of similar wounds; so that, up to the middle of August, there was no reason for suspecting septicæmia[3] with the exception of the chill of July 23; this latter was, I think, explained at the time upon sufficient grounds. The expression further on in the editorial, "the explosion of July 23 was much more than the formation of a pus sac," is unjust. Dr. Bliss, in his report, says: "We did not feel sure that this superficial collection of pus was the principal cause of the aggravation of the symptoms present." In regard to the fatal hæmorrhage from the splenic artery, the writer goes on to say that "no one will be so absurd as to claim that the rent in the artery was made by the ball at the time of its entrance into the body. No slowly dissecting aneurism would have resulted from such an injury," etc., etc. In the first place, no one, to my knowledge, ever called the aneurism a dissecting one; it was a traumatic aneurism.[4] In the second place, I cannot see the absurdity of believing that the artery was wounded by the ball, the bleeding causing the formation of a traumatic aneurism that afterwards, by giving way at a point of less resistance, caused death. Every surgeon is familiar with the fact that such aneurisms occur in the axilla, in the popliteal space, in the course of the femoral artery, from rupture of the artery in the attempt at reduction of old dislocations of the shoulder, and lastly, from stabs and gunshot wounds. Further on the writer states that "the erosion of the arterial coats must have been due to their involvement in the ulcerative process going on in the track of the ball; tissue death instead of tissue building." But there was no ulceration at all in that portion of the track of the ball to the left of the spine, as seen by the entire absence of pus; there was no death of tissue instead of building, as is seen by the firm adhesions of the sides of the opening in the artery to the surrounding tissue, as well as by the closing of the track of the ball and the complete encysting of the latter. These are all processes of repair. But more, "the peripheral portion of the clot in this vicinity was disposed in pretty firm concentric layers," clearly showing the formation of an aneurism a considerable time previous to the occurrence of the fatal hæmorrhage, and a tendency to repair in the clot itself. Further on the editorial says, "the occasion of the septic infection is manifestly to be found in the retention and incomplete escape of the debris and discharge from that part of the wound beyond the fractured eleventh rib." The report of the autopsy says, "the track of the ball between the point at which it fractured the eleventh rib and the first lumbar vertebra was considerably dilated, and the pus had burrowed downward through the adipose tissue behind the right kidney, and then had found its way between the peritoneum and right iliac fascia, making a descending channel that extended almost to the groin." On the 26th of July an incision was made, enlarging the opening between the fractured ends of the eleventh rib, and through this the sinus extending towards the groin was washed twice a day. On the 8th of August the above incision was enlarged and continued down to this sinus so as to facilitate the discharge. So that here it is shown that the retention of pus in the track of the wound between the fractured rib and the vertebra did not take place, and therefore could not have been the cause of the septicæmia.

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[1] The reference figures inserted in this review refer to the paragraphs in the Editorial Rejoinder which follows—ED.

"We cannot but regret," says the editorial, "that the occasion of the removal of the splinter of the rib on the 26th of July was not improved for the thorough exploration of whatever condition lay beyond it. Had the sinus leading to the vertebra been freely laid open, it might have been that the nation would not have been in mourning to-day; for certainly there was nothing necessarily fatal in the condition of the bone itself." No one claims that the condition of the bone was the cause of death. We all know that death was caused by secondary hæmorrhage from the aneurism, and how the laying open of the sinus between the eleventh rib and the vertebra would prevent this is not clear.[5] But the condition of the bone was undoubtedly the cause of the septic condition of the blood. The danger arising from wounds of these bones and their connection with septicæmia was long ago insisted upon by Cruvielhier; the arrangement of the veins of the bone exexplains this easily. The next criticism is in regard to the deflection of the ball. It is claimed that no deflection took place, because Plate XV in Braune's Atlas of Anatomy shows that the wounds of the ribs and the first lumbar vertebra, and the place where the ball was found behind the pancreas, can all be connected by a straight line. However, a straight line cannot connect these three points with the place where the assassin was at the time of the shooting.[6] By taking this into consideration the deflection of the ball is clearly seen. Other reasons given to show that the ball was not deflected are that conical balls go through the tissues and bones in a straight line, and that the ball was not flattened. In the surgical history of the War of the Rebellion (part second, chapter iv, page 8) the following remarks occur: "It is an error to suppose that cylindro-conical musket balls are rarely deflected; they often pursue long subcutaneous or intermuscular tracks." Then, again, Dr. Weisse (*Medical Record*, July 16, 1881) has demonstrated that the English bull-dog revolver had small penetration, and that the bullet from it was easily deflected by the bones. As to the flattening of the ball, it is not necessary that a ball should get flattened in all cases of deflection, as, for instance, in cases when balls are deflected by muscles and fascia. M. FIGUEIRA.

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## EDITORIAL REJOINDER.

The review of the case of the late President Garfield, which appeared in the November issue of this journal, was intended to be a candid and impartial discussion of the most important features of the case. Judicious and fearless criticism is inseparable from progress. Blind respect for authority means stagnation and retrogression. There is no man so perfect that he makes no mistakes. It has been well said that we learn more from our mistakes than from our successes. In a case of such importance and notoriety as that of our lamented President, it becomes especially desirable that the most full discussion be had of the methods of its treatment; all personal elements become eliminated; its scientific aspects alone remain. We regretted greatly that we were unable to endorse fully all the surgical treatment of this case as being the very best which the surgery of to-day has to offer, even when the grounds upon which our judgment was formed were the statements of the one who was especially interested in making the most favorable exhibit of the manner in which the case had been conducted. The same criticism which we give to others we do not shrink from receiving in turn, and accordingly have willingly given the same prominence to Dr. Figueira's review of our review as that which was given to the original review. Some of the remarks of our friend require some comment.

1. It would certainly be of value and interest if the exact positions of the President and of the assassin at the moment of the shooting could be determined. Beyond the general fact, however, that the assassin was in the rear and to the right of the President, and distant but a few feet from him, it is absolutely impossible to go. Any attempt to state with trigonometrical exactness the relative positions of the two actors in this drama would be foolish and futile. If the condensed resumé in the November editorial be read carefully, it will be seen that the statements that the shooting was at short range, that the wound was in the back, and that the point of entrance was to the right of the spine, contain the essence of all that can be said with certainty on the relative positions of the two men.

2. As to the ætiology of the bronchial catarrh and of the broncho-pneumonia, Dr. Figueira's criticism may be correct. In making our resumé, however, we confined ourselves in all matters of fact simply to the statements of those in attendance upon the patient. The statement in question is made by them ; to them we refer the criticism.

3. We infer from this that our friend is of opinion that the conditions which developed after the middle of August were such as to warrant the suspicion that septicæmia was present, although not before. It is difficult to harmonize this with his later statement that he is satisfied that the incisions of July 26 and August 8 so prevented any retention of pus in the portion of the wound leading to the vertebra, that the occurrence of septicæmia from that cause could not have taken place, but that it was due to the peculiarities presented by the veins of the body of the injured vertebra. Does not our friend see that he condemns himself ? Were not the venous sinuses of the cancellated tissue present previous to the middle of August ? Was it not during this period that pus retention and burrowing was going on ? What prevented their becoming active agents in producing septicæmia when all the other conditions favored it, only to become disastrously active when the requis-

ite means to avert it had been taken? Our friend has fallen into error from not clearly distinguishing between pyæmia and septicæmia. The readiness with which the venous sinuses of the vertebræ, when opened by wounds of those bones, may develop suppurative phlebitis, and occasion in due course, all the phenomena of pyæmia, will not be denied. But the case of the President at no time presented these. For the entrance into the blood of the minute organisms upon which septicæmia depends, the venous sinuses of the vertebræ do not afford conditions any more favorable than the soft tissues in general.

4. The play on the word "dissecting" is hardly fair. The word is used in its proper generic sense, and not in the technical sense which is here referred to. The interest which centres about the rent in the splenic artery is great. To the mind of the writer the idea that a wound four-tenths of an inch long, in such an artery as the splenic, could have any other result than speedy death, deserved the term given to it. The hæmorrhage from such a wound is not comparable to the diffused aneurisms occurring from rupture of the arteries of the extremities. We repeat the statement of our belief that the torrent of blood, issuing from such an artery, effused into the loose post-peritoneal connective tissue, would not have been eleven weeks in dissecting its way to the point where the final peritoneal rupture took place. It was not our intention to discuss in detail the pathological processes which are recognized as usually present in the production of a secondary hæmorrhage in the track of a gunshot wound. Of the two modes in which such hæmorrhages arise, the separation of a slough produced by the contusion of the ball, or ulceration attending unhealthy suppuration, we reject the first because of the long period which elapsed between the infliction of the wound and the rupture of the artery. Had it occurred within the first thirty days, a greater probability would have been established that it was due to this cause; that it did not occur until after more than seventy days entirely eliminates such a cause from consideration. The methods of the autopsy were such that it is impossible to substantiate the assertion that "there was no ulceration at all in that portion of the track of the ball to the left of the spine." The attempts at repair which are adduced as arguments against the action of any ulcerative process—viz.: the adhesions of the sides of the rent in the artery to the surrounding tissues, and the lamination

of the peripheral portion of the clot in the immediate vicinity of the vessel—are not inconsistent with the view that the original opening was caused by ulceration, and that within a few days of the final issue. It more frequently happens that in such arterial erosions the first hæmorrhage is but slight, that it occurs again and again at longer or shorter intervals, until finally it becomes profuse and overwhelming. Time is given for such futile attempts at repair as were found in the present case. The whole history of the case harmonizes perfectly with this view.

5. If the views which have been expressed as to the cause of the hæmorrhage from the splenic artery are correct, it will be no longer possible to divert attention from the real cause of the fatal issue of this case. This was but a mode of termination of the septicæmia which had become the controlling element in the case. The chief occasion of this septic infection the surgeons in attendance certify to have been the injured vertebra; with this opinion our friend coincides. The chain of reasoning by which the conclusion was reached, that if the sinus leading to the vertebra had been freely laid open, possibly a different termination to the case might have been secured, must be apparent.

6. The assertion that the line of the bullet-track in the body was not in a straight line with the place where the assassin stood at the moment of the shooting is unsupported by any proof. The theory of deflection must have stronger support than an improbable assertion, if it is to be accepted, while all the known anatomical and pathological and physical facts unite in rejecting it. LEWIS S. PILCHER.

## RÜCKER[1] AND HERMANN[2] ON FRACTURES OF THE BASE OF THE SKULL.

The thesis of Mr. Rücker is an exhaustive and valuable contribution to the study of the subject which he undertakes to discuss. His object is to show that indirect fracture of the base, in gunshot wounds of the skull unconnected with the direct fracture produced by the missile, is due to hydraulic pressure, the brain acting as the medium of transmission. After reviewing in detail seventeen cases collected from various sources, among them the interesting one of President Lincoln, he considers the experiments of Heppner, Garfrickel, Busch and Kocher, in all of which the experimentors had failed to produce the desired results. He attributes their failure to the use of fire-arms of too great power, or of subjects in an unnatural condition—*i. e.*, too dry—and arranges his own experiments with a view to avoid these sources of difficulty. He reports ten experiments made chiefly with a revolver, two upon uninjected subjects, two upon subjects previously trephined, and six upon subjects forcibly injected, and upon the results of his experiments and a consideration of the reported cases deduces the argument in favor of hydraulic pressure. The general result of the experiments was that indirect fracture occurred only in the injected subjects, and in these also a more vigorous spurting out of brain substance was remarked, though it occurred to some extent also in the other cases. The seventh experiment gives a most interesting result as bearing especially upon the point at issue. "A fissure of the lamina externa of the frontal bone was shown which began two centimetres from the median line on the right frontal base, and running in a crooked line downwards and to the left, involved the zygomatic process on its way to the temporal fossa, where it divided into a short upper and a long lower arm, ending on the great wing of the sphenoid." This experiment gives a result similar to one of the quoted cases, in which fissure of the lamina externa of the great wing was found. Longmore gave as his opinion, in the case of President Lincoln, that the fracture of the base "was due to undulatory movement or sudden impact of the brain substance upon the thin orbital plates." This assertion seems not to have attracted the notice it merited until Busch's experiments to some extent justified it. Busch recognized three factors in the production of indirect fractures in gunshot wounds of the skull—viz.:

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[1] Experimentelle und casuistische Beiträge zur Lehre von der Höhlenpression bei Schussverltzungen des Schädels. Inaugural-Dissertation von Gustav Rücker, Dorpat, 1881.

[2] Experimentelle und casuistische Studiern der Fracturen der Schädelbasis. Inaugural Dissertation von Nicolai Hermann, Dorpat, 1881.

(1.) Separation into parts of the missile.
(2.) Centrifugal force, produced by rotation of the bullet.
(3.) Hydraulic pressure.

Mr. Rücker devotes the body of his thesis to the discussion of these factors, and shows very successfully, both from the reported cases and the experiments, the predominance of the third in causing the lesion under consideration. Four instructive lithographic plates accompany the pamphlet.

Mr. Hermann discusses a kindred subject by the same method of comparing the results of experiments made by himself with the post-mortem results of reported cases, and deducing arguments therefrom in support of his views. The study of fractures of the base of the skull has always been a subject of great interest to surgeons. Bergman (Billroth und Pitha's Hand-buch der generellen und speciellen Chirurgie) says: "Without a knowledge of the elastic properties of the skull, the mechanism by which most of the fractures of the base occur, can be only falsely or with merely approximate clearness explained. To Bruns belongs the credit of having clearly elucidated, by reference to the elasticity of the skull, the occurrence of fracture of the base—a question which had agitated the medical mind since the middle of the last century." From a misunderstanding of Hippocrates arose the doctrine of *contre coup*. As the echo is thrown back from the point opposite that from which the sound is given, so vibrations from the point of impact uniting at a point opposite may produce fracture. This doctrine prevailed until Aran, for the very satisfactory reason that he could not convince himself of its truth by post-mortem results, and was unable to produce an illustration of it in a hundred experiments on cadavers, opposed it, and even went so far as to assert that all fractures of the base were direct and produced by irradiation. Clinical and experimental facts did not, however, support Aran's position, and in 1869 Sarazin and Farques again advocated the doctrine of *contre coup*. Later, Edarle and Brodie explained impact and counter-stroke more rationally by considering the skull subjected to two forces—viz.: the body on one side and the resisting surface on the other in case of falls, and the impinging object and the spine in case of blows. Mr. Hermann makes his experiments upon the basis of this view He had constructed a pressure apparatus worked by a screw, by means of which force could be applied in any given direction, and measurements taken during the experiment to ascertain the amount of yielding possible before the occurrence of fracture. He made seventeen experiments in all—five in the transverse direction, six in the longitudinal, and six in oblique directions. His conclusions in regard to elasticity are not so valuable as those of the lately publishedand more elaborate work of Messerer, since the number of his experiments was small, and he had not the facilities for the measurement of force, etc., which the latter enjoyed ; but a comparative table of results shows a substantial agreement on this point. The conclusions arrived at in regard to fracture are two—viz.:

(1.) That fracture of the base, in compression of the skull between two parallel surfaces, always runs in a direction parallel to the line of pressure.

(2.) Fracture begins at the point of pressure and runs thence to the base.

A comparison of seventy-five published cases seems, in general, to confirm the results of experiment, though imperfectness of description in regard to the direction of the force causing the lesion makes the investigation very difficult and somewhat unsatisfactory. The demonstration in regard to the first conclusion is sufficiently clear, and while the second is, no doubt, generally true, it is somewhat too absolute for the facts, and Mr. H. is a trifle obscure in his explanation of it. It is quite true that isolated fracture at the base would have become continuous with fracture at the point of impact if the force had been sufficient ; but the fact of these isolated fractures being sometimes found when there is no fracture at the point of impact, certainly shows that the break may begin at the weakest part of the skull between the points of pressure ; else we have little use for the term "indirect fracture." Certainly if, as is eminently proper, we exclude fracture from impact of the spine or condyles of the jaw and fissures running from the point at which the blow is received, the proportion of indirect fractures becomes very small, but they do occur, nevertheless, and are worthy of more consideration than Mr. H. is disposed to accord them. The term "fracture by *contre coup*" Mr. H. discards, and with propriety, since it is founded upon an erroneous doctrine and is unnecessary. The twenty-three lithographic plates which accompany the brochure add much to its clearness and interest.

J. Edwin Michael.

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# ANNALS
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MONTHLY.

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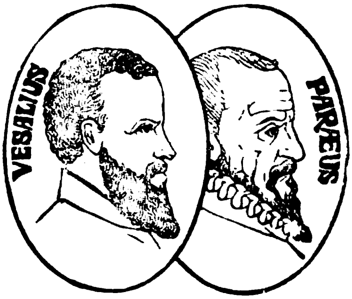

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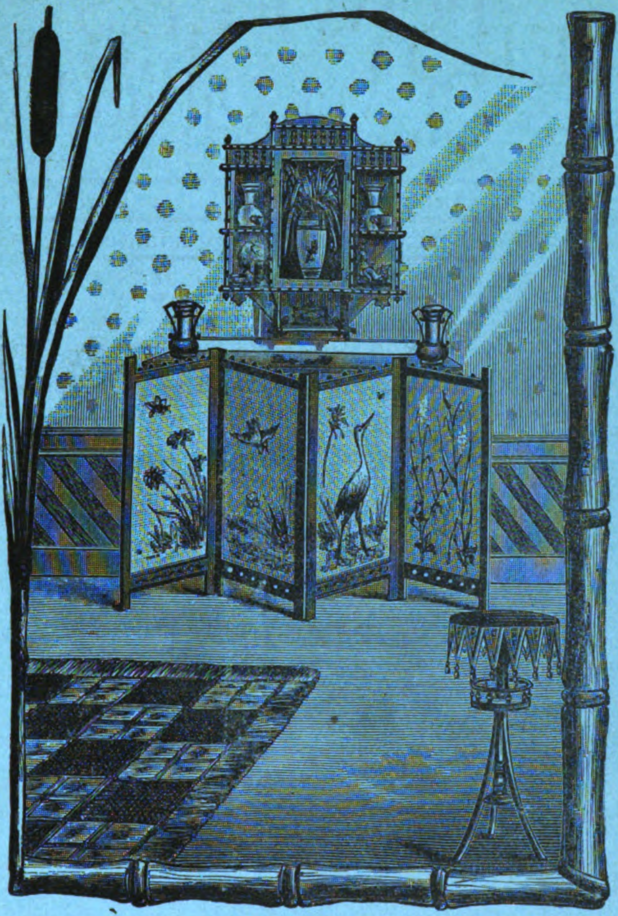

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*Dr. T. Hamilton Bush*, 19 *W. 42d St., N. Y. City*, writes: "I have tried all the pure Cod Liver Oils and Emulsions in the market one by one and discarded. I cheerfully give my earnest approval of POWELL'S BEEF, COD LIVER OIL AND PEPSIN, as being the most nutritious, easiest digested, and a combination manifesting its beneficial effects quicker than any oil combination that I have ever tried."

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*Dr. A. M. Powell, Catawba, N. C.*, writes: "I used POWELL'S BEEF, COD LIVER OIL AND PEPSIN on myself in a case of Dyspepsia of long standing, with torpor and want of tone in the digestive organs and liver. RESULTS, great relief in digestion, and quiet sleep instead of nervous wakefulness." Dr. P. considers the preparation eminently adapted for weakness and nervous diseases accompanied with impaired digestion.

*Dr. S. H. McIlroy, Morrisania, N. Y.*, writes that he tried POWELL'S BEEF, COD LIVER OIL AND PEPSIN on a patient with Bronchial Cough and with feeble digestion. RESULTS, much improvement in both. Dr. McIlroy says he considers the medicine meets the indications in these diseases, and will in all pulmonary affections.

*Dr. L. H. Griffith, Upper Marlborough, Md.*, writes he has tried POWELL'S BEEF, COD LIVER OIL AND PEPSIN in Phthisis complicated with indigestion, and that it acted speedily, and he considers the combination is just what the profession needs.

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* Kings Co. Med. Soc. Proceedings, May, 1880. † Practitioner (English), March, 1880.
‡ Kings Co. Med. Soc. Proceedings, May, 1880.

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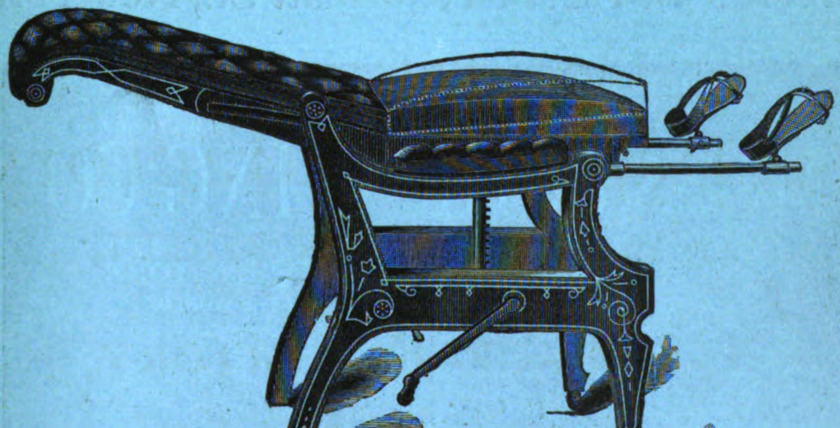

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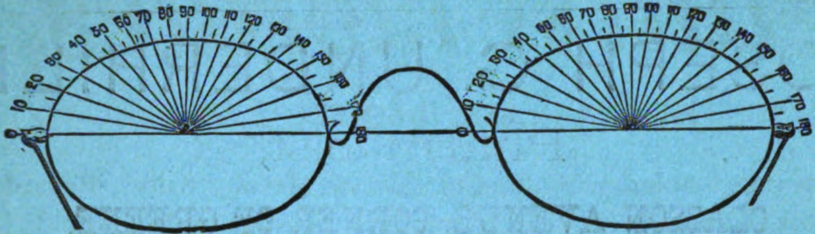

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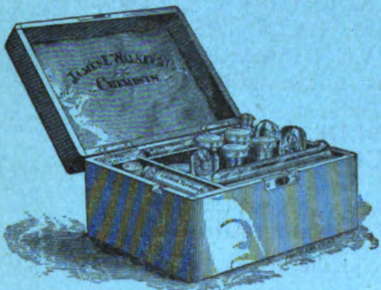

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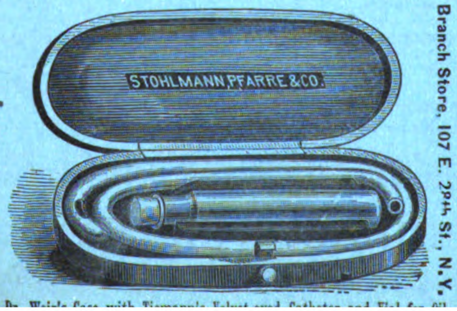
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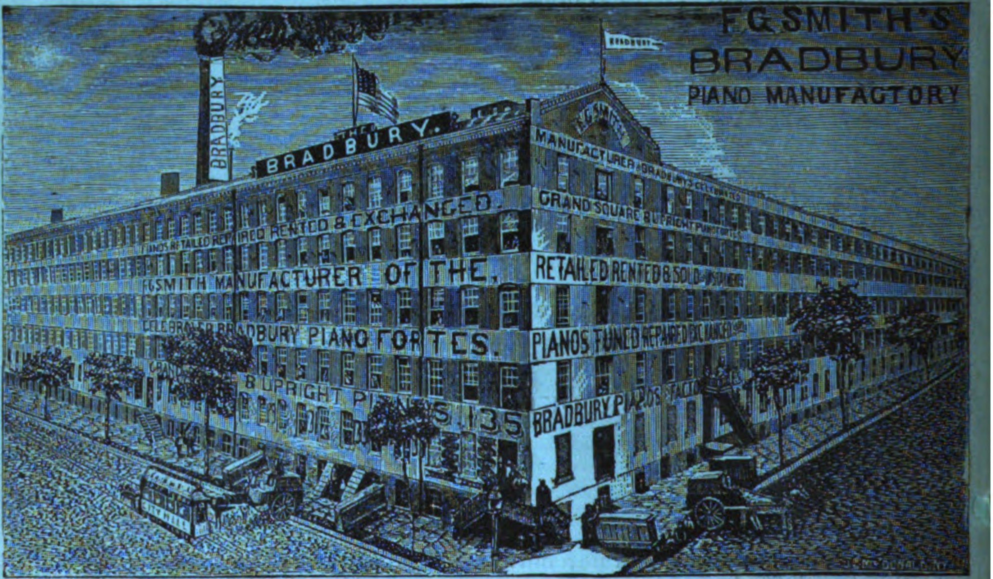
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